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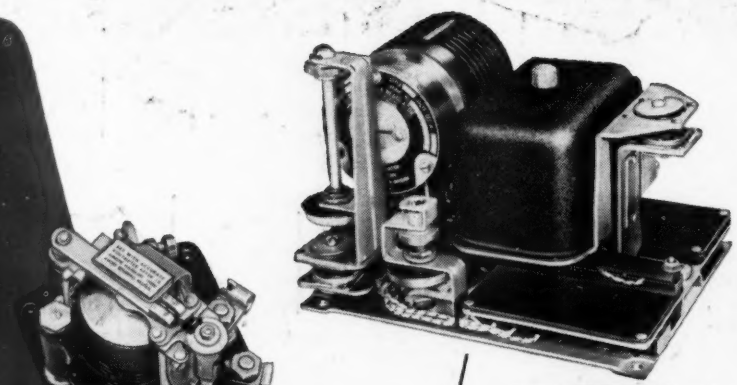
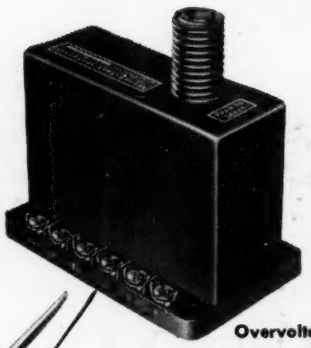
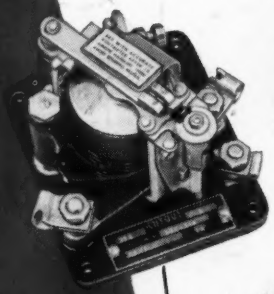


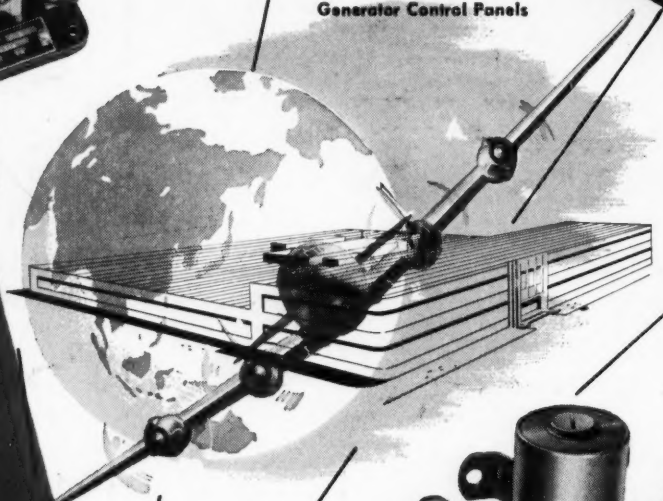
Generator Control Panels

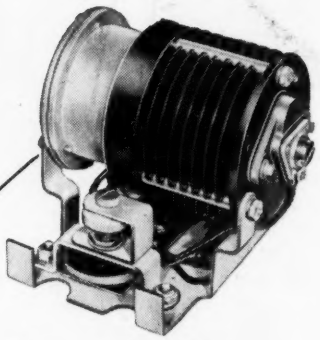


Overvoltage Protectors



Reverse Current Cutout
(Maximum Capacity, 100 Amperes)





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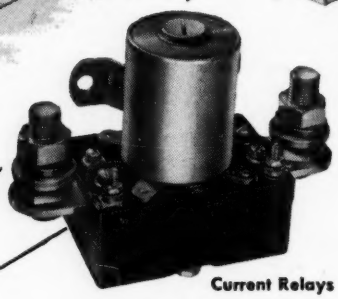

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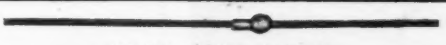
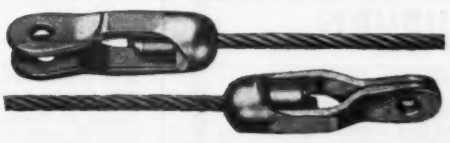


AN 664 Ball and Shank

AN 663 Ball and Double Shank



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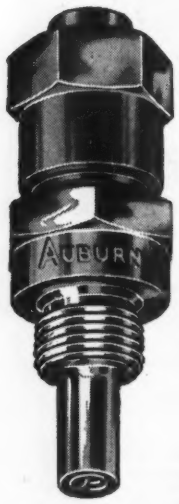

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Vol. 50, No. 5

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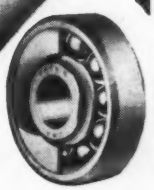

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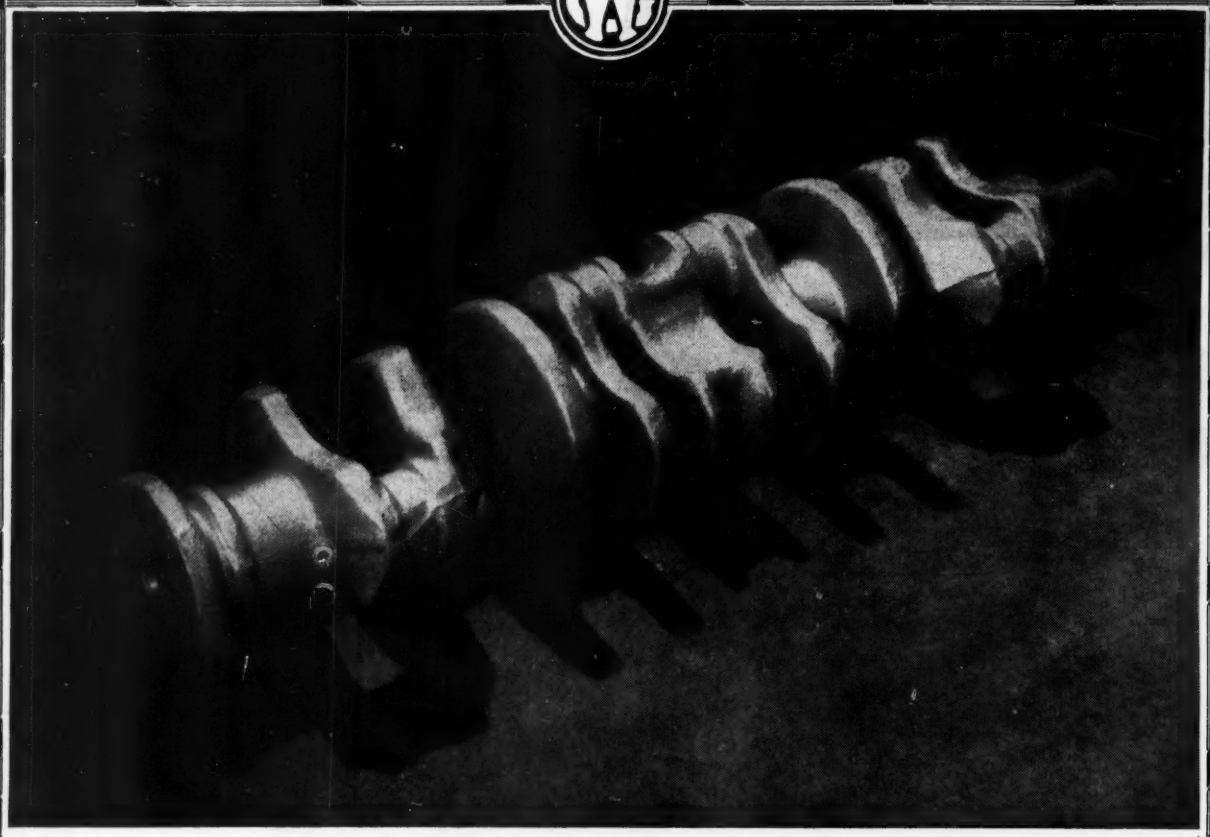

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CAB Wields Big Stick

The life and death powers wielded by the Civil Aeronautics Board over all segments of the U. S. air transport industry may be used with telling effect during 1949.

Since its creation in 1938, CAB has devoted much of its energy to enlarging the domestic and international route network and to certification of new carriers. Even during the past two years, when weak spots developed in the traffic picture and deficits throughout the industry grew to alarming proportions, the Board did not stop, but merely slowed its expansion of the air map.

The Door Is Closing

Now, however, newcomers—and even companies which for three or more years have been fighting for certification—are finding the door of opportunity in air transportation is closing fast. Nonscheduled airlines, all-cargo carriers and some feeders seem likely to be the first victims. But even the trunklines are braced for a blow.

CAB Chairman O'Connell has emphasized that the Board's power to alter, amend, modify or suspend a carrier's routes in the public interest may be used more frequently in the future. The chairman states bluntly that he disagrees with any theories which may exist "with respect to the sanctity in perpetuity of a certificate of public convenience and necessity." Concurring in this view, CAB member Harold Jones has asserted that a route certificate is merely "a privilege granted by the Board and one which confers no vested property rights."

Passenger-carrying nonskeds active domestically and to Puerto Rico and Alaska probably have the most tenuous lease on life. CAB's proposed withdrawal of the general nonscheduled exemption would enable Board enforcement officials to crack down immediately on irregular carriers operating with excessive frequency or regularity. Most nonskeds admit they cannot make money if they restrict their flights to a legal pattern. Several have tried conscientiously and have gone out of business. The nonskeds are making a frantic eleventh-hour effort to enlist public and Congressional support to forestall CAB's death sentence. But the outlook remains bleak.

Extremely Narrow View

Large uncertificated international operators such as Transocean Air Lines, Alaska Airlines and Seaboard & Western Airlines also are on the anxious seat. All have been doing a sizable and profitable businesss carrying passengers to and from foreign points under contract—frequently for the U. S. armed services and other government agencies. But CAB's view of legitimate contract activity is an extremely narrow one. The Board already has taken enforcement action against major international contract carriers. Whether a full-scale crackdown is in prospect seems to depend in large measure on how closely these companies can gear their services to national defense requirements and America's growing international commitments under the global "fair deal."

Fate of domestic all-cargo operations should be known very shortly. Most of the 14 uncertificated carriers that presented their arguments for certification at CAB hearings two years ago are out of business.

Five major all-cargo lines were recommended for certification by CAB examiners in March of last year. But the Board itself is likely to be less generous than its examiners. Without certification, there is little prospect that any large domestic all-cargo carrier can, or will attempt to, stay in business on a nonscheduled or contract basis. Seaboard & Western Airlines' irregular trans-Atlantic freight operation is jeopardized by the contemplated revision of the nonscheduled exemption.

Abandoned Applications

Casualties among the 19 feederlines CAB has designated for certification during the past three years appear certain. Late last summer, the Board refused to extend the franchise of Florida Airways past Mar. 28, 1949, but the carrier is still fighting hard for continued existence. Chances that at least three other feeders can ever activate their systems seem negligible, and the franchises may be cancelled.

CAB has been feeling its way slowly and cautiously toward suspension or revamping of trunkline services which are now authorized on a presumably permanent basis. The Board's investigation to determine whether National Airlines' routes should be transferred to other carriers has given the industry a severe headache. In refusing to dismiss the NAL probe, CAB hinted broadly that it may be the first in a series of similar moves to revise and improve the route pattern "for the good of the industry." CAB Chairman O'Connell believes the Board has a responsibility to take the initiative in situations which are obviously uneconomic. He was warned the industry against obstructionism. "Some personal and corporate ambitions will have to be relinquished," O'Connell declared in pointing out that serious consideration must be given to desirable mergers and consolidations.

"Surgery" May Be Remedy

O'Connell's strong stand recalls the statements made by former CAB Chairman James M. Landis early in 1947 when the Board decided to reappraise the need for activating Chicago & Southern Air Lines' Caribbean routes in view of the high subsidies involved. Landis said flatly that "surgery" might be the only remedy for the situation.

This month, in the All American Airways decision, CAB rejected arguments that it lacked the power to suspend a certificate. The Board said it could have suspended operation of the pickup service even if All American had not given its consent.

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AVIATION CALENDAR

Jan. 31-Feb. 4—American Institute of Electrical Engineers, winter general meeting, Hotel Statler, New York.

Feb. 7-9—American Road Builders' Assn., 46th convention, Mayflower Hotel, Washington, D. C.

Feb. 8—ICAO Operations division, Montreal.

Feb. 19-27—National Sportsmen's Show, Grand Central Palace, New York.

Feb. 22—ICAO Airworthiness division, Montreal.

Feb. 23-24—Aerial agricultural spraying conference, Community Bldg., Manhattan, Kansas.

Feb. 24-25—4th annual aviation conference, Washington-Youree Hotel, Shreveport, La.

Mar. 3—Society of Automotive Engineers, metropolitan section, air transport meeting, Engineering Societies Bldg., New York City.

Mar. 10-12—Annual meeting of American Society of Tool Engineers, Hotel William Penn, Pittsburgh.

Mar. 18—Annual national aircraft propulsion meeting, Hotel Carter, Cleveland, sponsored by IAS.

Mar. 22—ICAO African-Indian ocean air navigation meeting, Algiers.

Mar. 22-24—Air Transport Assn., annual airline engineering and maintenance conference, Continental Hotel, Kansas City.

Apr. 25-27—American Association of Airport Executives, Oklahoma City.

Apr. 11-13—Society of Automative Engineers national aeronautic and air transport meeting, Hotel New Yorker, New York.

Apr. 11-16—Western Metal Congress and Exposition, sponsored by American Society for Metals, Shrine Civic Auditorium, Los Angeles, Calif.

Apr. 19-21—AIEE, southwest district meeting, Baker Hotel, Dallas, Tex.

Apr. 22-24—Second Annual Oklahoma City Air Show, sponsored by Oklahoma City Chamber of Commerce.

May 2-4—2nd annual meeting of the Airport Operators Council, Denver.

May 19-21—Society for Experimental Stress Analysis, spring meeting, Hotel Statler, Detroit, Mich.

May 23-24—Annual meeting of the Magnesium Assn., Edgewater Beach Hotel, Chicago.

June 3-12—Michigan Aviation Week.

June 20-24—AIEE, summer general meeting, New Ocean House, Swampscott, Mass.

July 3-4—First Annual Southern California International Air Race, Long Beach.

July 13—ICAO North Pacific regional air navigation meeting, Seattle.

Aug. 29—Federation Aeronautique Internationale, Cleveland.

Sept. 3-5—National Air Races, Cleveland.

Sept. 26-28—National Electronics Conference, Edgewater Beach Hotel, Chicago.

PICTURE CREDITS

14—Kollsman; 15—Wright Aeronautical Corp.; 20-21—Kaman Helicopter; 30—AAF (bottom); 36—PAA.

This is an actual photograph of the flow pattern of air moving at twice the speed of sound.

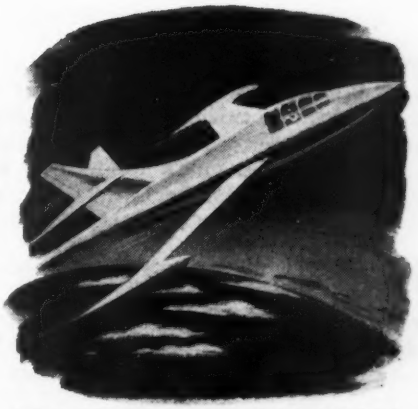
TWICE THE SPEED OF SOUND

▸ A small-scale model of a ram jet inlet is mounted in Wright's supersonic wind tunnel. As the air flows at mach No. 2 (twice the speed of sound) through the tunnel, *schlieren* apparatus—an optical instrument—accurately photographs the influence of the jet's body lines upon the flow pattern of the air. The oblique lines in picture represent shock waves created by impact of body on air.

▸ These *schlieren* pictures provide valuable new data on the phenomenon of compressibility—a condition that exists at the speeds attained by jet and rocket propelled aircraft and guided missiles.

▸ From them, Wright design engineers can determine the most efficient passage shapes for ram jets and other types of supersonic power plants.

▸ Another example of the integrated research that enables Wright Aeronautical to provide better power plants for the aviation industry.



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INDUSTRY OBSERVER

► Two experimental models of Chance Vought's Cutlass (XF7U-1) have flown from Patuxent, Md., to the Vought Dallas plant in the first cross-country flights of the sweptwing, twin-jet Navy carrier fighter. Stops were made at Sumter, S. C., Montgomery, Ala., and Shreveport, La. Bill Millar and Bob Baker, Chance Vought test pilots, flew the planes.

► Vought plant in Dallas is installing solar afterburners as standard equipment on the 30 service test models of the Pirate (F6U-1) now being assembled in Dallas. First of the 30 Pirates is expected to roll off the Dallas line this month.

► Boeing plans two final assembly lines at its Renton plant for accelerated delivery of C-97A Stratofreighters to the Air Force. Renton employment will be increased to 1600 by Mar. 1 when the assembly lines are expected to begin operations.

► Air Force and Convair have not yet decided what model jet engines will be slung under the wingtips of the Convair RB-36 to produce supplementary power for the four Pratt & Whitney Wasp Major 3500 hp. engines normally used. Allison J-35 axial flow jets are currently being given top consideration with the General Electric J-47 also a possibility. In no case will the Allison J-33 centrifugal flow jet be used, as was erroneously reported in some publications. The proposed RB-36 underslung jet nacelles, similar to those on the Boeing XB-47, require an axial flow engine for streamlining purposes.

► Navy Squadron VR-8 of MATS led squadrons on the Berlin airlift during December by delivering 8539 tons of cargo. This was 1444 tons above the squadron's assigned quota and set a new record for airlift squadron efficiency. VR-8 also set an airlift record with 4.3 trips per plane during a 24 hr. period on Dec. 16. The squadron made 51 round-trips to Berlin carrying full loads in their C-54s to and from the blockaded city.

► Aviation Maintenance Corp., Van Nuys, Calif., may be the production agency of Baumann Aircraft Corp. in manufacture of the latter's twin-pusher four passenger light transport, the Baumann "Brigadier". Baumann's previous plan to manufacture at Santa Barbara under a new $2.5 million corporation, Baumann Aviation, Inc., has been abandoned. Engineering modification of the successfully flown prototype Brigadier is under way at AMC's shops, and a static test unit is under construction for CAA testing. J. B. Baumann, company president, anticipates first deliveries of the plane before the end of the year. Plans call for an initial production run of five aircraft which probably will be priced at $22,500 each.

► A two-cylinder engine originally designed for the Lockheed Little Dipper, and credited with 52 hp. for takeoff, is now destined for use in a new midget plane being developed as a spare-time hobby by Lt. Col. M. D. Willis, long-range weather pilot at Fairfield-Suisan AFB, Calif. He is also using the Little Dipper's wheels, acquired, like the engine, from surplus after the Lockheed midget plane project was shelved.

► USAF will get prototypes of at least two 800 mph. interceptors during 1949. Both the Lockheed F-90 and the Republic F-91 are nearing completion. Convair's F-92 project already has one developmental model flying at Muroc where the F-90 and F-91 are scheduled to make their initial flights under a heavy blanket of secrecy.

► Slide rule manipulators point out that compressibility not power is apt to be the limiting factor on B-36 speed. USAF and Convair are attempting to increase the present 356 mph. maximum true air speed at 40,000 ft. in the RB-36 by adding four jet engines to the normal six Wasp Majors. Since the B-36 design has a limitation of Mach. 71 which is 465 mph. at altitudes above 35,000 ft., the slide rule experts believe it may not be safe to operate the giant bomber faster than 450 mph. at its bombing altitudes.

NEWS DIGEST

Big 5 Ask $1 Fare Rise

An agreement by the five major airlines to increase all one way fares by $1 was filed with CAB for approval last week. Eastern, American, Northwest, TWA and United specified no effective date but they announced they would file appropriate tariffs shortly. The move will be made "provided similar action is taken by other certificated carriers at competitive points." Proportional increases will be made in round trip fares and other fares which are presently subject to special discounts, the agreement stated.

DOMESTIC

Dr. George J. Mead, co-founder of Pratt & Whitney Aircraft Co. (now a division of United Aircraft Corp.), died at his home in West Hartford, Conn., after a long illness. He was 57. He was designer, in 1925, of the first Wasp engine. He retired in 1939 as vice president and chief engineer of United.

Piper Aircraft Corp. will make a strong bid for a larger segment of the personal aircraft market Feb. 1, when the new $2995 PA-16 Piper Clipper, lowest priced four-placer on the market, is announced at a national distributors meeting. Powered with a 115 hp. Lycoming engine, the plane is in some respects similar to the four-place Family Cruiser which Piper will continue to make. Performance quoted: 112 mph. cruising speed with 480 miles range; 50 mph. stalling speed, 125 mph. top speed, 600 ft./min. rate of climb.

Port of New York Authority and airlines serving New York City resumed direct discussions last week on the issue of using Idlewild. Break in the months-old deadlock came after New York Supreme Court Judge Thomas J. Cuff offered to assist in out-of-court settlement.

FINANCIAL

Bendix Aviation Corp. reports consolidated net income for fiscal year ended Sept. 30, 1948, of $11,280,742, on sales totaling $162,495,665. Sales of automotive products accounted for about $60 million of the total, with no figure indicated for aircraft sales. Backlog at the fiscal year-end was $162 million, including engineering projects.

Texas Engineering & Mfg. Co. in a preliminary report disclosed 1948 sales of about $8.5 million. Net income was $370,659, equal to $3.31 a share.

Waco Aircraft Co. reported to Cincinnati Stock Exchange net loss for year ended Sept. 30, 1948, of $115,638, against loss of $579,988 in the previous year. Company now is engaged primarily in non-aviation manufacture.

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AVIATION WEEK

January 31, 1949

Safety Office Focus of New CAA Changes

Two present officials both claim to have been promised job when Marriott leaves.

By Alexander McSurely

An impending shakeup in CAA's Office of Aviation Safety last week was the latest development in the big federal agency's reorganization which has kept its 17,000 employes on the edge of their seats for the last six months.

Al Koch, former assistant administrator in charge of the office and E. S. Hinsley, who remained as deputy safety administrator after Koch's transfer last October, were both awaiting the return of Administrator Del Rentzel from Montreal to see which one would get the job about to be relinquished by Joe S. Marriott.

▶ **Marriott's Plans**—Marriott, characterized as the "hatchet man" for the reorganization, has advised Administrator Rentzel that he wishes to return to his West Coast assignment as sixth region CAA administrator, but has consented to remain in Washington temporarily as a special assistant to aid in the final stages of the reorganization.

Observers last week weighed effects of two forthcoming outside studies on the proposed decentralization of CAA for which Marriott has been the primary advocate.

▶ **Rising Protest**—Rising protest against decentralization to an extent which would put the bulk of CAA regulatory power in the hands of the regional staffs without a strong check in Washington was being heard in many quarters of the aviation industry, including representatives of manufacturers, fixed base operators, and pilots.

New slants on CAA's organization were to be given by a management study made by a New York firm under CAA contract, and by a special Hoover Commission CAA report, a first draft of which has already been submitted.

▶ **Rentzel in Canada**—Donald Nyrop, assistant to Rentzel, said last week that Rentzel planned to announce his decision on the Aviation Safety appointment on his return from Canada later last week. He said Rentzel was considering additional names in addition to those of Koch and Hinsley as successor to Marriott.

Koch told his old subordinates that Rentzel had given him to understand that he would probably be reappointed. But Hinsley, at the same group meeting, told the same group including Koch, that Nyrop was recommending him as successor to Marriott, presumably with Rentzel's agreement. Hinsley said the appointment was to have been cleared through Civil Service before Rentzel left to go to Montreal for an ICAO conference. But this schedule was not met, apparently because Rentzel left a day earlier than he had planned.

▶ **Management Report**—Nyrop said that one report, concerned with relatively unimportant details had already been made to CAA by the New York management survey firm, that a second was due around Feb. 1 and that a final summary would be presented around Mar. 1.

A checkup of the results of the Rentzel CAA reorganization since it was first announced in vague outline Oct. 1 discloses scant progress. Rentzel announced Oct. 1 that Koch would be transferred, that the Office of Aviation Information would be downgraded to become part of a new aviation development office and that the Office of Field Operations, headed by Howard Rough, would be abolished, presumably as part of Marriott's decentralization plan.

▶ **Stern Restored**—Since that time the Office of Aviation Information has been restored to its former independent status with the same head, Ben Stern; Howard Rough has been named assistant administrator in charge of state and field relations, and now either Koch or Hinsley is due to head Aviation Safety.

Both have been under fire within the industry for reactionary tactics, and for hampering interpretations of Civil Air Regulations sent out under their names. Hinsley is reportedly well down on a Civil Service seniority promotion list, in relation to other CAA officials equally qualified in background for the safety post.

▶ **UPMA Blast**—Most outspoken criticism of the CAA reorganization thus far has been the blast aimed at Rentzel in the January newsletter of United Pilots & Mechanics Assn.

"It is no secret that within the last two months the morale of CAA employes has reached an all time low due to lack of confidence in the methods by which Administrator Rentzel and his hatchetmen have set out to revamp the Washington office," the UPMA letter asserted.

▶ **Nine Policies**—The newsletter referred to Marriott as a "persistent agitator" for complete decentralization of CAA activities to the regions and declared: "Adoption of the policy expounded by Marriott will result in establishment of different policies in each of the nine CAA regions and Washington will be powerless to control them."

The newsletter also criticised an alleged attempt of the administrator to short cut requirements for a two-engine pilot rating; free rides to U. S. senators in CAA planes; the proposed purchase of the Ardmore, Okla. pilot training base from American Airlines, and Rentzel's recent trip to London and his negotiations about radio ranges which had been sold to the British by Aeronautical Radio, Inc., Rentzel's former employer.

▶ **Over-Regionalization** — A recent Air Line Pilot Assn. publication attacked proposed "objective" regulations for the airlines, and discussed the "grave question of over-regionalizing the CAA."

"Does the new CAA planning contemplate that what little leftover air safety regulation that remains after the objective regulations, will be regionalized to such a degree that the right hand will not know what the left hand is doing? Apparently it's actually being proposed," the ALPA letter said.

Navy '48 Report Presented by Sullivan

Navy took delivery of 946 piloted aircraft and 723 pilotless planes during fiscal 1948, according to Navy Secretary John L. Sullivan, in his annual report for that period. Navy now has 1773 piloted aircraft on order under contracts authorized in fiscal 1948 and 1949 budgets.

Among the goals of Naval Aviation research, Sullivan listed the following projects:

▶ **High Speed Propellors**—Definite progress has been made on development of

propellers for "super-powered high speed aircraft."

▶ **Aircraft Armor**—Particular stress is being placed on the armoring of jet engines to reduce effects of battle damage. Use of composite materials as a source of armor for aircraft and development of a fiber-fabric body armor for aircrews are being investigated.

▶ **External Storage**—Navy is exploring the best possible shape for external storage containers on aircraft for items such as droppable gas tanks, armament, etc.

▶ **Tactics**—Navy has contracted for a study of the effects of new high speeds on air tactics including firing ranges, angles of possible attack, maneuverability and ammunition requirements for high speed fighters and bombers.

▶ **New Materials**—Sullivan reported substantial progress in use of titanium and magnesium base alloys; heat and impact resistant aircraft finishes; and noninflammable hydraulic fluid.

▶ **Automatic Controls**—Sullivan pointed out that aircraft speeds may soon be reached where manual control of an airplane as we now know it may no longer be possible. Developments in this field are now aimed at increased use of automatic methods of control.

During the 1948 fiscal year the Navy overhauled 3940 aircraft and 5385 aircraft engines in its own shops in addition to modifying another 2534 aircraft. Total of 272 transport type aircraft were overhauled by commercial operators under Navy contracts. At the end of fiscal 1948 (last July) Navy had 2800 planes in storage.

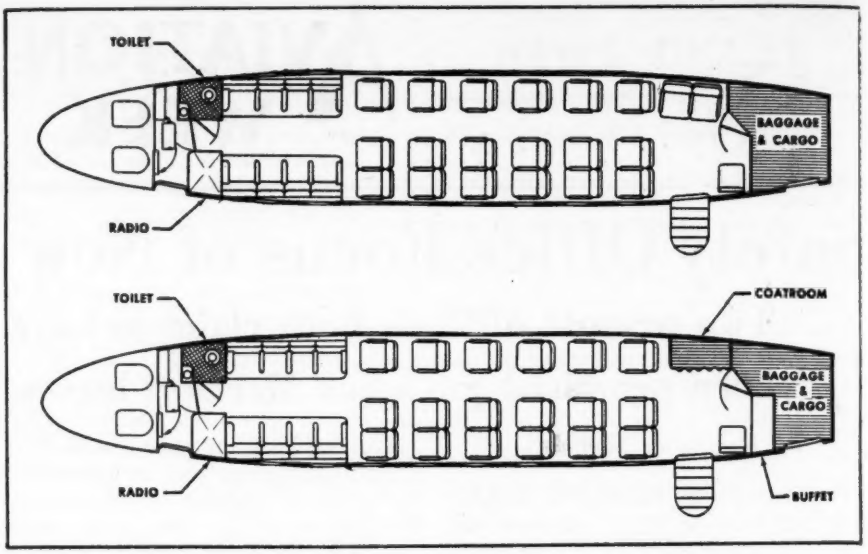
British Seek B-29s From USAF Storage

British are interested in acquiring approximately 180 Boeing B-29 Superfortresses from U. S. Air Force storage pools, according to London reports.

U. S. Air Force had no official confirmation of the British request last week. Informed Washington sources said the proposed B-29 deal would be part of the foreign military aid program under the proposed North Atlantic Defense Pact. President Truman has indicated he will submit the pact soon for Senate approval.

Indications are that the British B-29 request leaked out as a result of the drafting of each North Atlantic countries detailed needs for military aid. A French air mission was recently in this country for a similar purpose. Neither the French nor British aid programs can be implemented until the North Atlantic pact gets Senate approval.

USAF still has 500 B-29 in temporary storage with another 800 on operational status (400 in use with the other 400 as an operational reserve.)



Douglas Describes 'Super DC-3'

Higher cruising speed, increased seating capacity and major structural changes feature modernization plans.

Details on the Douglas Aircraft Co. proposal to modernize the DC-3 airliner into a Super DC-3 were revealed last week by Donald W. Douglas in Santa Monica.

The Super DC-3 will feature a cruising speed of 235 mph.; 28 passenger capacity; gross weight of 27,500 lb.; and a direct operating cost of 1.25 cents per seat mile with a 100 percent load factor and 1.75 cents per seat mile with 20 passenger load.

▶ **Structure Changes**—Structurally the Super DC-3 will feature a new wing and empennage; increased engine power; simplified passenger and cargo loading methods and reduced drag through fully retractible landing gear.

Details on the structural changes in the Super DC-3 include the following:

Super DC-3

Dimensions	
Span	90 ft.
Length	64 ft. 5.5 in.
Wing area	970 sq. ft.
Flap area	87 sq. ft.
Wing sweepback (trailing edge)	4 deg.
Weight	
Max. gross takeoff	27,300 lb.
Max. gross landing	26,400 lb.
Operating empty*	19,091 lb.
Manufacturer's empty	18,075 lb.
Capacity payload	5650 lb.
Performance (Estimated performance at 26,900 lb., or as noted)	
Level flight speed with 67% S.L. rated power (855 BHP/Eng.)	
At 5000 ft.	230 mph.
At 10,000 ft.	242 mph.
Level flight speed with 60% S.L. rated power (765 BHP/Eng.)	
At 10,000 ft.	232 mph.
CAA takeoff field length	
At S.L.	3450 ft.
At 5000 ft., gross weight of 26,000 lb.	4850 ft.
CAA landing field length, gross weight of 26,000 lb.	
At S.L.	3690 ft.
At 5000 ft.	4200 ft.
Two-engine rate of climb at S.L. and rated power	1680 fpm.
Two-engine service ceiling with rated power	26,600 ft.
One-engine en route ceiling	11,800 ft.

* *Consists of crew, trapped fuel and oil, passenger equipment and full operating oil capacity.*

• **New Wing Panels**—Sweepback and twist have been incorporated in the new outer wing panels. These panels are removable and can be replaced quickly. Wing is swept back about 4 degrees in contrast to the almost straight trailing edge of the original DC-3. Center wing flap has been extended 14 inches into the outer wing panel. Ailerons are equipped with geared tabs on both sides.

• **Revised Tail**—Area and span of both horizontal and vertical tail surfaces have been increased to meet increased design loads.

• **New Engines**—Choice of either Pratt & Whitney R-2000 or Wright Cyclone R-1820 C-9HE engines are offered. Weight of the Super DC-3 is increased 400 lb. with the R-2000 engine installation but some airlines prefer it since they use the same engine on their DC-4s and would save time and money in maintenance. In addition to the engine change the Super DC-3 has DC-6 type exhaust stacks with electrically operated cowl flaps and a ducted type oil cooler installation.

• **Landing Gear**—Main wheels of landing gear are now fully retracted into engine nacelles. Wheel well doors have been added to enclose the tires which formerly protruded partially. Tail wheel is now retractible to further reduce drag. Higher pressure hydraulic system cuts landing gear retraction time to 7 seconds.

• **New Loading Methods**—Integral loading step is built into the Super DC-3 cabin door. Front cargo compartment which required high loading stands has been eliminated in favor of a rear cargo compartment at waist level behind the cabin door. Baggage stored in this compartment is easily available to passengers as they deplane.

• **Increased Passenger Capacity**—Variety of interior seating arrangements is offered ranging from 26 to 28 passengers. Two four-passenger divans are featured in the 28 passenger layout while cargo compartments are increased in 26 and 24 passenger versions. Toilets are located forward and space aft of the cabin is occupied by the enlarged cargo and baggage compartments.

▶ **Costs Compared**—The Super DC-3 is aimed at meeting the airlines critical equipment replacement problem for medium transports. According to Douglas, the Super DC-3 will have a cruising speed roughly comparable to CAA figures on the DC-4, Convair-Liner and Martin 2-0-2. It will cost the airlines an estimated $150,000 per plane for the Super DC-3 as against approximately $500,000 apiece for twin-engine transports on the market.

Douglas figures show a direct operating cost of 2.40 cents per seat mile for a "typical 40 passenger transport" as

Congressional Scoreboard

Following aviation bills were introduced in Congress last week:

Government Air Transportation — Legislation which would channel government transportation business into scheduled air carriers was introduced by Sen. Edwin Johnson (D., Colo.), chairman of the Senate Interstate and Foreign Commerce Committee. The bill would authorize the government to transport personnel and cargo by air, but only on carriers which are holding public convenience and necessity certificates.

National Defense Establishment — Would be reorganized under a bill proposed by Sen. Wayne Morse (R., Ore.). Under the Secretary of Defense would be an under secretary and three assistant secretaries for Army, Navy and Air Force.

70-Group Air Force—Would be authorized under a bill by Sen. Millard Tydings (D., Md.), chairman of the Senate Armed Services Committee. Similar legislation was previously introduced in the House by Chairman Carl Vinson (D., Ga.) of the Armed Services Committee and others.

Contract Settlement — Legislation making the wartime procedure for settlement of cancelled government contracts effective in peacetime, long urged by Aircraft Industries Assn., was proposed by Sen. Owen Brewster (R., Me.).

Five-Year Plans—For aeronautical research, development, and production would have to be submitted to Congress each year by the National Military Establishment under a bill by Brewster.

Lighter-Than-Air—Research and development program would be launched by the Maritime Commission under a bill by Brewster.

Commercial Plane Development — Brewster reintroduced his bill authorizing the government to finance prototype costs on new commercial transport and cargo craft. Identical legislation was presented on the House side by Rep. Carl Hinshaw (R., Calif.). Bills authorizing the government to purchase (for leasing to the airlines) new cargo planes, as well as develop them, but differing in several basic respects, were introduced by Sen. Johnson and Rep. John Kennedy (D., Mass.). Rep. Lindley Beckworth (D., Tex.) proposed a measure authorizing the government to spend up to $50 million a year in financial aid for plane development.

Department of Transportation—Embracing the Civil Aeronautics Administration and the Civil Aeronautics Board is proposed in a bill by Sen. Homer Capehart (R., Ind.). The measure was sponsored in the House by Rep. Karl Stefan (R., Neb.).

CAA Reorganization — Measures by Sen. Pat McCarran (D., Nev.) would establish an independent civil aeronautics authority and an independent air safety board. Several bills by Brewster would augment Civil Aeronautics Board, giving it a $12,000-a-year director, reduce CAA to an office of civil aviation in the Department of Commerce, and establish an independent arm—director of air safety.

CAA Procurement—Law would be modernized to meet the requirements of its airway facilities development and installation program under a bill by Johnson. Negotiated and cost-plus-fixed fee contracts would be permitted (AVIATION WEEK, Jan. 3.).

CAA Authority—In connection with examinations, inspections, and testing, could be delegated to private individuals under a measure by Johnson, introduced in the House by Rep. Robert Crosser (D., Ohio), chairman of the Interstate and Foreign Commerce Committee.

Capitol Airport—A new airport in the vicinity of the District of Columbia would be authorized by a bill by Johnson.

Uniform Federal Regulation—Of air commerce, except local traffic, is laid out in a measure by Johnson.

State Enforcement—Of federal air safety regulations is provided for in a measure by Brewster.

Air Mail—Transport of all first class mail by air to expedite delivery would be authorized under a measure introduced by Brewster.

Board of Postal Rates—To set rates each year to supply sufficient revenue to meet Post Office operating costs, would be authorized by a bill by Rep. Katharine St. George (R., N. Y.).

Chosen Instrument—Legislation authorizing a consolidated company of all transportation interests to monopolize all overseas air business was sponsored by Brewster and McCarran.

Sea-Air—The way would be opened for steamship companies to obtain air route certificates under a bill by Capehart.

Multiple Taxation—Of air carriers would be removed by a measure by Brewster.

Transportation Tax—Of 15 percent on persons and property would be repealed by a measure by Rep. Karl Stefan (R., Neb.).

Overseas Facilities—CAA is given broad authority to establish and maintain overseas airports and airway facilities under a measure by Brewster.

Contract Carrier Investigation — A thorough investigation of all laws and regulations relating to air contract operations, to improve air safety, is proposed in a resolution by Rep. John McGuire (D., Conn.).

Private Plane Airports—A "national superhighway system", with adjacent airports, is proposed in a measure by Rep. T. Millet Hand (R., N. J.).

CAB Delegation—Of authority, to speed up Board actions, is authorized in a measure by Johnson.

against 1.75 cents for a Super DC-3. This is with a 20 passenger load.

With full load the direct cost is 1.20 cents for the "typical 40 passenger transport"; 1.25 cents for the super DC-3 and 1.66 cents for the regular DC-3. Indirect costs are estimated by Douglas at 35 cents per plane mile for the Super DC-3 against 48 cents for the "typical 40 passenger transport."

▶ **Use 483 DC-3s**—Certificated airlines are now operating 483 DC-3s compared with 513 a year ago. Regular DC-3s are tagged for obsolence in 1952.

Douglas recently surveyed the airlines on their interest in the Super DC-3 project but has not yet announced any firm orders for the changes. Bulk of the modification work would be done at the Douglas Santa Monica plant.

WAA Has Chance For New Life

War Assets Administration, which still has surplus aircraft components with an original value of nearly $500 million has a good chance to get a Congressional reprieve from the expiration of the agency scheduled Feb. 28.

Two factors pointing strongly in this direction:

- President Truman's budget message which asked Congress to transfer remaining functions of WAA to a central property management agency. (It is believed an extension will be necessary to allow time for drafting legislation setting up such a new agency.)
- Department of Air Force wants to get out from under the job of handling the surplus aircraft and components, and Air Force Secretary Symington has asked Congress to relieve Air Force of this task before it gets it.

The President's budget message listed principal surplus property expected to remain Feb. 28 as $2,100,000,000 in real property, of which $750 million is on lease, and between $400-500 million in aircraft components (original cost value) and a small number of leased aircraft lsited at $24,497,000 (original cost value).

Under terms of the 1949 Supplemental Independent Offices Appropriation Act, abolishing WAA as of Feb. 28, the surplus real property would be taken over by Reconstruction Finance Corp., and the surplus aircraft property by the Department of Air Force for disposal.

Secretary Symington's annual report last week warned that USAF's progress in other channels would be impeded by the increased work load of handling surplus disposal. He pointed out that a deficiency appropriation for this new task would entail preparing budgetary requirements, increasing "the already heavy workload" of the Air Force Comptroller and the Air Materiel Command. He asked Congressional action before Feb. 28 to stop the impending transfer.

Simplest action in this direction, pending legislation creating the central property management agency asked by the President, would be an extension of the life of WAA for 90 days or six months until outlines of a new agency could be drafted. With Congress in its present frame of mind to cooperate with the executive department, observers think such an extension is likely.

If Department of Air Force does have to take over the surplus aircraft disposal problem, however, letters outlining procedures have already been sent by Air Materiel Command to War Assets Administration agents. They include:

- Continue to dispose of surplus aircraft and aircraft parts as rapidly and efficiently as is practical.
- Utilize services of agents essentially as under WAA.
- Draw new contracts with all approved agents effective Mar. 1 enabling separate handling of any reconciliations necessary under old contracts.
- War Assets Disposal division, Air Materiel Command, Wright Field, Dayton, Ohio, will handle the operating of disposal procedures according to general policies estabilshed at USAF headquarters, Washington.
- Col. John C. McCawley is chief of AMC's War Assets Disposal division.

Mahon Named

Rep. George Mahon (D., Tex.) was named chairman of the House Armed Services Appropriations subcommittee which will have a major voice in deciding Air Force funds this year.

Mahon vigorously supported funds for a 70-Group USAF program last year and told AVIATION WEEK that he has had no change of mind on the matter (AVIATION WEEK, Jan. 24).

Others named to the subcommittee: Rep. Harry Sheppard (D., Calif.); Rep. Robert Sikes (D., Fla.); Rep. Albert Engel (R., Mich.) Rep. Charles Plumley (R., Vt.).

Williams Crash

Al Williams, Gulf Oil aviation manager and veteran stunt flyer, crashed his new Grumman F-8-F "Gulfhawk" and walked away unhurt from the flaming wreckage last week. The crash was at Simmons-Knott Airport, New Bern, N. C. on his way north after he had stunted the plane at Miami Air Maneuvers.

EASY-TO-READ ALTIMETER

Now under service testing by Air Force and Navy is Kollsman's "160" altimeter (left), which eliminates two of the pointers and has a two-digit counter to record altitude in thousands of feet (Aviation Week, Jan. 17). Its easy-to-read feature is apparent by reference to the former type of altimeter (right). In photo, both instruments are registering 16,090 ft. Key to Kollsman's new instrument is the extremely lightweight cylinder counter, the first development of its kind, the company claims.

Correction

To those saving the table on Revised Military Plane Orders that appeared in AVIATION WEEK Jan. 24, page 12:

The table should list Bell Aircraft Corp.'s order for nine HTL Navy helicopters as $.6 million instead of $6 million. The Convair order for 39 RB-36s should be $290 million instead of $200 million, bringing the Convair total to $311 million.

AVIATION WEEK regrets these typographical errors.

John K. Northrop presents American Honorary Fellowship to Clark Millikan.

William A. M. Burden makes his inaugural speech as new president of the Institute.

Maj. Gen. Laurence S. Kuter, MATS commander, addresses Honors Night dinner.

I.A.S. Meeting Accents Aviation Progress

Wide variety of subjects covered in 17th annual session; plans for future outlined.

In one of the most extensive examinations ever made of aviation's progress and current status, the Institute of the Aeronautical Sciences last week in New York used the four days of its 17th annual meeting to illustrate how the aeronautical engineer's field of inquiry has broadened.

From Monday morning until nearly midnight Thursday—with time off for business lunches and one formal dinner—about 1000 registrants could listen to lectures that ranged from rotating wing aircraft to human engineering. Speakers covered such varied subjects as cloud physics and a liquid oxygen converter for aircraft. (See page 16.)

▶ **Scope Extended**—The widened area of investigation necessary in aeronautics is illustrated by some of the organizations that joined I.A.S. in the program: the American Meteorological Society, the American Physical Society and the Institute of Navigation. The opening session, on rotating wing aircraft, was sponsored jointly by the Institute and the American Helicopter Society.

This variety of sciences now involved in aeronautics is one reason I.A.S. expects to increase its activities greatly this year, according to Director S. Paul Johnston. Another spur to activity is the growing number of local sections throughout the U. S. and Canada.

▶ **Fellowships Awarded**—At the Honors Night dinner, outgoing President John K. Northrop, president of Northrop Aircraft, Inc., cited other Institute efforts. On May 24-27, I.A.S. will hold joint meetings with the Royal Aeronautical Society of Great Britain in New York City, a follow-up to the joint meetings at which the British organization played host more than a year ago. Later this year, Northrop said, I.A.S. hopes to open its new buildings in Los Angeles and San Diego.

As one of his last acts as retiring I.A.S. president, Northrop presented four of the institute's six annual awards, and the two Honorary Fellowships and nine Fellowships (AVIATION WEEK, Jan. 24). Two other I.A.S. honors, the Thurman H. Bane Award and Octave Chanute Award, were presented last summer at the Los Angeles meeting. It is expected that these two awards, which usually have been presented at the Honors Night dinner, hereafter will be made in the summer.

▶ **Burden Inducted**—Only one of the Honorary Fellows, Clark B. Millikan, acting director, Guggenheim Aeronautical Laboratory, California Institute of Technology, was present at the dinner. The other, the Foreign Honorary Fellow, is J. Laurence Pritchard, secretary of the Royal Aeronautical Society. Northrop pointed out that no more than two Honorary Fellows—one American, the other foreign—can be elected in any one year. They are chosen by the Fellows, now numbering 172, Northrop said, out of a total I.A.S. membership of about 7000.

At the conclusion of the Honors Night dinner, William A. M. Burden, former Assistant Secretary of Commerce for Air, took office as the new president.

During the course of the award presentations, Dr. W. Randolph Lovelace II, head of the section of surgery, Lovelace Clinic, and winner of the John Jeffries Award, disclosed that for the first time flight surgeons are ahead of aircraft designers. He said that researchers had perfected equipment making it possible for a pilot to withstand a negative force of 5 G. But present fighter planes, he declared, are built to take a negative force of only 3 G.

Weather No Bar To Airlift Operation

All-weather flying regularity has been achieved on the Berlin airlift and there is no longer any relation between weather and the tonnage put down, ac-

cording to Maj. Gen. Laurence S. Kuter, commander, Military Air Transport Service. He gives most of the credit to the "remarkable" traffic control procedures employed.

Kuter last week told guests at the I.A.S. Honors Night dinner at the Hotel Astor in New York City that GCA is a key factor in the traffic control system, and that it is working "about five times as rapidly as it has ever done before." On Jan. 14, he said, planes were landing at Berlin in intervals of 50 seconds, around the clock for 24 hours.

▶ **Control Advanced**—The MATS commander quoted Robert V. Garrett, Civil Aeronautics Board air safety inspector, as declaring that Vittles "has advanced the art of traffic control ten years." According to Kuter, Garrett concluded that the concept of traffic control used in the airlift "could easily be applied to New York, Washington or Chicago immediately without adversely affecting the slow private aircraft."

To back up his claim that weather no longer is related to airlift tonnage, Kuter pointed out the rise in tonnage since the great November fog crippled all transport in the Western Zone of Germany. In the seven-day period from Dec. 31 to Jan. 6, U.S. planes alone put down 37,379 tons, a daily average of more than 5000 tons. The daily requirement is 5000 tons.

▶ **Conclusions**—Terming Operation Vittles "on every count the greatest air transport operation the world has yet seen," Kuter drew these conclusions:

- "It is worth while to consider" that the progressive overhaul (cycle reconditioning) used on Vittle planes should be applied "to the (nation's) fleet of large transport, commercial and military."
- Strategic airlift, which will be vital in war, depends in great measure on development of a "great national fleet of large transports" used commercially. "Without this . . . MATS would be helpless" in time of war.
- A speed of "about 250 mph." is sufficient for these large transports. "In this era of jet and supersonic speeds it is important, I think, not to transfer this emphasis on speed to the field of air transport, where it is in fact a secondary consideration."
- Vittles has "underscored the importance of integration." Air Force and Navy are working as a team on the airlift and if they had been separate services the duplication would have been a serious handicap. "Today Air Force and Navy crews receive uniform training for Vittles at one school. Their logistic support comes to them through one channel, over one air route, in planes of their own command."
- Because of the airlift, "many know what few knew before—that anything, anything, can be moved anywhere by air."

'Synthetic Aircraft' Now Being Built

A "synthetic aircraft" than can duplicate exactly the flight characteristics of a prototype before the prototype is built now is nearing completion, Adm. Luis de Florez, USN (ret.) declared in a paper prepared for delivery last week at the 17th annual meeting of I.A.S.

De Florez, wartime head of the Navy Bureau of Aeronautics Special Devices Center, said the new project is carrying one step farther work previously done in reproducing in electronic trainers the flight characteristics of existing aircraft. As an example of how accurate existing techniques are, he cited a wartime experience with a flight trainer of the PB4Y.

▶ **Changes Conform**—The electronic engineers working on the trainer advised de Florez that the directional circuit was unstable. They made adjustments to obtain stability and then de Florez found out that the PB4Y prototype, then being flight tested, was directionally unstable. Changes that were made in the prototype to produce stability (extension of the fin area) corresponded exactly to the changes in the electronic circuit made to give directional stability in the trainer.

The present project, which de Florez did not identify, merely puts the trainer construction ahead of the prototype.

Because of the saving in time and cost of re-engineering generally found necessary in flight testing a prototype, de Florez estimates that construction of the synthetic aircraft plus the prototype actually would be cheaper than construction and testing of the prototype alone.

Number of Papers Set I.A.S. Record

Reaching a new high in the variety and number of aeronautical topics covered, the I.A.S. meetings last week heard 53 papers representing the work of 87 scientists. On two occasions, it was necessary to hold simultaneous sessions in two different rooms.

Following are summaries of selected papers. Summaries of the remainder of the papers will be published in Aviation Week next week.

ROTATING WING AIRCRAFT

McDonnell Ramjet Helicopter—Charles R. Wood, Jr., Chief Test Pilot and Manager, Helicopter Contracts, McDonnell Aircraft Corp.

Five basic arrangements were investigated in this ramjet development. Flight tests, conducted with four setups, progressed from first operations with ground fuel supply to fully controlled free-flight for qualitative checks of performance and handling characteristics. Development of service-type ramjet copter progresses in accordance with Air Materiel Command contract, two configurations of pulse jet rotors have also been investigated.

Method for Improving Inherent Stability and Control Characteristics of Helicopter—R. H. Miller, Associate Professor of Aeronautical Engineering, Massachusetts Institute of Technology.

Problem of copter control and stability is examined to establish whether satisfactory inherent characteristics may be achieved without major design modifications and recourse to automatic control devices.

Possibility exists of improving both damping and static stability of hovering copter by relatively minor modification of blade mass and aerodynamic characteristics together with use of springs and dampers in control system. This should give improved blind flying characteristics and reduction in excessive control sensitivity without sacrificing maneuverability.

Control characteristics of such inherently stabilized rotor-craft are evaluated via transient response characteristics to abrupt control manipulation.

INSTRUMENTS

Automatic, Self-Powered, Quick-Pressurizing Evaporator for Liquid Oxygen—W. A. Wildhack and D. S. Goalwin, National Bureau of Standards.

Relative advantages of liquid oxygen and evaporators (converters) for aircraft use are analyzed together with theory of reflux cycle for pressurizing and design details of converter built on this principle for Navy Bureau of Aeronautics.

Converter holds enough oxygen for 10 men for 10 hr. Pressure attains preselected operating value quickly and gas is delivered on demand at up to 150 lpm., warmed to within 2 deg. C. of ambient temperature. If temperature requirements are not stringent, flows of 1500 lpm. are obtained. Pressure is maintained automatically.

New High Performance Engine Indicator of Strain Gage Type—C. S. Draper, Director of Instrumentation Laboratory, and Y. T. Li, Research Associate in Aeronautical Engineering, Massachusetts Institute of Technology.

Holding that pressure indicators in use have performance defects restricting their value even for laboratory and test stand work, this paper gives details of new pressure receiver using high flexibility catenary-type diaphragm and temperature compensating wire-wound strain gage to give satisfactory pressure measuring characteristics with greatly reduced response to temperature and extraneous mechanical effects.

AIRCRAFT DESIGN

Convertible Aircraft—R. S. Barnaby, Chief; S. M. Berkowitz, Project Leader; and W. H. Colcord, Assistant Chief, Aeronautics Section, The Franklin Institute.

Need for research and development leading to reduction of minimum speeds is stressed, and analytical study of problems presented in combining fixed- and rotating-wing principles in one aircraft is urged, to obtain the advantages of both types.

Convertible planes are divided into two general classes—rotor axes remaining substantially vertical, and axes changing from vertical to horizontal in conversion. These classes are divided into groups, examples are cited, critical phases of operation discussed.

Measurements in Flight of Spanwise Wing Loading—W. Lavern Howland, Flight Service Engineering Supervisor, Lockheed Aircraft Corp.

Reflecting the opinion that accurate determination of spanwise loading on high speed airplanes becomes increasingly important with the advent of thin wings and sweepback, this study stresses the importance of this load distribution and considers various discrepancies in recent investigations on bending moment distributions. Procedure for accurate measurement in flight is detailed together with results on four different types of planes. Advantages of strain gages are outlined, flight measurements and wind tunnel data compared.

FLIGHT PROPULSION

Designing for Gas Turbine Materials—M. H. Young, Chief, Materials Laboratory, Wright Aeronautical Corp.

Design engineers have become accustomed to high level of uniformity and standardization in present-day processing and materials. When dealing with turbine materials, however, there are variables in melting and fabrication which affect properties. There is also a lack of standardization in design practice, emphasizing the need for better instrumentation in obtaining reliable temperature and stress determinations during early stages of experimental testing. Importance of minimizing thermal gradients for rotor disks and blades is also considered.

Past rate of new alloy development cannot probably be maintained, and more attention should be paid to designing and fabricating around materials now at hand so that more service data can be accumulated.

Factors Affecting the Range of Rocket-Powered Aircraft—Thomas F. Keinhardt, Rocket Group Engineer, Bell Aircraft Corp.

Here is a method of weighing the relative importance of specific impulse and propellant density for rocket-propelled craft. Specific impulse and density are shown to be of equal importance for planes with low wing loading, but specific impulse becomes more important for high wing loading, and high ratios of propellant weight to total weight.

TRANSONIC, SUPERSONIC AERODYNAMICS

Influence of Acceleration on Aerodynamic Characteristics of Thin Wings in Supersonic and Transonic Flight—C. S. Gardner, Research Associate, and H. F. Ludloff, Associate Professor, New York University.

If a two dimensional thin wing moves with constant acceleration into still air, disturbance may be described by perturbation potential which obeys a wave equation, the boundary condition on airfoil surface and a kind of initial condition requiring that the disturbance vanish at the curved characteristic surface passing through leading edge. This boundary condition problem has been solved by use of Possio's method. Pressure, lift and drag are obtained in form of elliptic integrals, expanded in terms of an acceleration parameter.

In supersonic range, aerodynamic characteristics are approximately obtainable by quasi-stationary treatment. At very high accelerations, drag decreases proportionally to square of the acceleration. At Mach 1, expressions for lift and drag of an accelerating two dimensional wing do not diverge, but have a finite value and pass continuously through the sound speed. In sonic range, even small accelerations have a very considerable influence on the aerodynamic characteristics.

Dynamic Stability at High Speeds from Unsteady Flow Theory—I. C. Statler, Aerodynamicist, Flight Research Dept., Cornell Aeronautical Laboratory.

By considering non-uniform motion of an airplane's aerodynamic components, effects of frequency of oscillation upon response to a regular, even, sinusoidal motion of the elevators are determined. Variations of stability derivatives with frequency and magnitudes of higher order derivatives are obtained. In addition, effect of oscillating wing wake upon horizontal tail surfaces is considered. Analysis is based upon a modification of Dietze's solution for lift distribution over harmonically oscillating thin airfoil in subsonic compressible flow.

Problem of Drag at High Subsonic Speeds—A. Busemann, Compressibility Research Division, Langley Aeronautical Laboratory, NACA.

Consideration is to find the real critical Mach number in theoretical sense: First appearance of shock waves is an inviscid fluid following many boundary conditions.

Since it is known that some solutions of potential flow with a velocity pattern containing subsonic and supersonic flow do exist, it may be that exceeding the sonic velocity will not result in a condition in which the critical Mach number, considered in the theoretical sense, is exceeded.

It can be demonstrated that potential streams with transonic (mixed) flow patterns are the exception rather than the rule. In overwhelming majority of cases, flow past a given body at high subsonic speeds lead to a solution containing shock waves (indicating mixed flow) which is unique for that body. Since these unique solutions are exceptional, existence of real critical Mach number probably does not exist as a general rule.

These considerations can, in the main, be applied to three dimensional cases.

A Sharp Focusing Schlieren System—W. S. Miller and Arthur R. Kantrowitz, Graduate School of Aeronautical Engineering, Cornell University.

Evaluated is schlieren system with multiple sources and corresponding cutoffs to afford sharp focusing property. Each source-cutoff combination produces independent schlieren image and, for a given screen position, only the shadows produced by density gradients at a single plane in the flow superpose exactly. In general, for planes out of focus, offset superposition of images blurs out effects of density gradients not in focal plane, action being similar to focusing properties of ordinary lenses.

FLUID MECHANICS

Interaction Between Parallel Streams of Subsonic and Supersonic Velocities—H. S. Tsien, Professor of Aerodynamics, and M. Finston, Supersonic Laboratory, Massachusetts Institute of Technology.

Essential feature of boundary layer-shock interaction is demonstrated by use of simplified model: Layer is replaced by uniform subsonic stream of finite width, bounded on one side by the solid wall and on the other side by the interface with the uniform supersonic stream of infinite extent. Flow fields of two cases are analysed in detail —compression wave in the supersonic stream incident upon the subsonic layer, and outgoing compression waves generated by a sudden change in the slope of the solid wall. Both types of disturbances are assumed to be small so that linearization of differential equations is possible.

General result is that distance of upstream propagation is directly proportional to width of subsonic layer. Hence, when boundary layer is turbulent and

subsonic layer is very thin, there is negligible softening of the shock.

Temperature and Velocity Profiles in the Compressible Laminar Boundary Layer with Arbitrary Distribution of Surface Temperature—Dean R. Chapman and Morris W. Rubesin, High Speed-Research Division, Ames Aeronautical Laboratory, NACA.

Evaluated is method for calculating temperature and velocity profiles in compressible laminar boundary-layer flow without pressure gradient but with arbitrary distribution of surface temperature. Final results are relatively simple and can be applied in any given case.

Effects of variable surface temperature on velocity and temperature distribution in boundary layer are shown to be pronounced. Example is presented which illustrates many essential features of boundary layer flows with variable surface temperature.

Theory is applied to calculate skin friction drag and to consider circumstances under which addition of heat can contribute to flow separation.

STRUCTURES

Station Functions and Density Variations in Flutter Analysis—Manfred Rauscher, Associate Professor of Aeronautical Engineering, Massachusetts Institute of Technology.

Station functions have been devised for correlating motions of masses at different stations in a vibrating system. Tie-in is analogous to that between ordinates of a curve at a series of stations in development of Simpson's Rule. Use of the functions combines conveniences of working with discrete masses and of having continuously defined deflections. Examples show functions to serve well both for calculations of vacuum modes and for determination of flutter modes.

Air density variations have been considered as a means of fixing flutter conditions corresponding to chosen value of flutter parameter *k*. Attractiveness of scheme lies in automatic coverage of flutter performance at various altitudes and in avoidance of calculations for hypothetical sets of frequencies and airspeeds at air densities fixed in advance.

Theories of Plastic Buckling—Dr. S. B. Batdorf, Structures Research Division, Langley Aeronautical Laboratory, NACA.

Development of a satisfactory theory for the plastic buckling of plates has been hampered by non-existence of an established polyaxial stress-strain relation in plastic range. A new theory of plasticity which is of neither the flow nor deformation type has been developed. It is based on concept of slip, and formulation was guided more by physical and less by mathematical considerations than previous theories.

Experimental evidence is in better agreement with the new theory than with either flow or deformation theories. New approach accounts for apparent contradictions and justifies use of deformation theory in the analysis of plastic buckling problems.

Theory and Tests on Plastic Stability of Plates and Shells—P. P. Bijlaard, Professor of Applied Mechanics, Polytechnic Institute of Delft, Holland.

Practical design formulas are developed for plates and shells having various edge conditions and subjected to different loadings for the case when they buckle under stresses exceeding material's elastic limit. Formulas are based on an analysis of plastic behavior of the structural element. Results obtained from this theory are in good agreement with tests. Formulas are compared with results obtained by Ilyushin, Handelman and Prager, and Stowell.

AIR TRANSPORT

Military Air Transport Service Specifications and Requirements For Cargo Aircraft—Major R. R. Hajek, Chief of Aircraft Materiel and Equipment Branch, MATS.

Here are Military Air Transport Service specifications for cargo type aircraft to achieve three primary factors: Ease of loading, ease of maintenance, and low cost of operation. Supplementary data are on the value of pod type aircraft.

Evaluation Criteria for Transport Aircraft—L. G. Kelso and R. L. McBrien, Technical Development Staff, and R. D. Kelly, Superintendent of Technical Development, United Air Lines.

Criteria for evaluating adaptability of a transport plane to specific type of operation are classified into the following primary groups: Operational economics, safety, performance, weight and balance, customer reaction, and maintenance. Each group is discussed with most emphasis on economics and performance. Sample route analysis illustrates method for anticipating earning power of transport plane in a specific operation. Provided is check list of items that must be weighed in evaluating economic and operational utility of transports.

Airborne Radar As An Airline Navigation Aid—N. G. Beard and R. W. Ayer, Director and Assistant Director, respectively, American Airlines, Inc.

American Airlines took a war-developed airborne radar, revised it, and discovered that it had several important uses in commercial airline operation. Flight research personnel found they could fly blind below level of hill tops with ease and security using the radar alone. Thunderstorms could be not only avoided but negotiated, most dangerous icing conditions avoided, and soft spots in deep fronts found with ease.

Using radar beacons or responders placed on ground at each end of a landing runway, simple and precise instrument approaches could be made, precise approach-area and cross-country navigation was available, and method of presenting information to pilot was discovered that was superior to usual system of dials and gages.

Simplified Monitoring System for Airborne Electronic Devices—W. E. Fensler, Chief, Special Projects Unit, Electronic Analysis Section, Air Materiel Command.

This information is intended to interest American industry in the advantages and economies of a German system of testing and replacement-maintenance of electronic equipment in the expectation that future requirements for both ground and airborne electronics devices will specify incorporation of these improved features.

System is predicated on two associated ideas—self-contained circuitry to permit rapid and easy isolation of faults, and simplified method of fault correction.

Problem in this investigation was to measure eye movements while flying by instruments without visual reference to the ground. Forty USAF pilots, representing a range of experience from "typical" to "expert" were used as subjects. Movie-camera records were taken during five precision maneuvers, blind approaches using ILS, and approaches with GCA.

Conclusions are that average eye fixations on instruments are from two to three times as long as fixations in reading. It appears that eye movement patterns are a function of difficulty of interpretation, reading precision necessary, and importance of displayed data. Data provide useful basis for evaluating particular instruments and instrument arrangements.

Some Important Causes of Disorientation in Pilots—Ashton Graybiel, Captain (MC) USN, U. S. Naval School of Aviation Medicine.

A pilot may become disoriented in flight as result of stimuli from sensory organs even though these are functioning normally. Reasons for this are to be found in the complexity of the orientation task and the response to various stimulus situations. Pilot is faced with the necessity of being properly oriented to the plane, to the earth, and possibly, to other objects as well. Orientation to the plane rarely poses difficulties because cues are provided by the eyes, the labyrinth, and the sensory elements concerned with superficial and deep sensibility. Of all these, only visual cues can be relied upon for orientation to the earth. The others are misleading whenever resultant force to which the flyer is subjected differs in direction from the force of gravity. Hence, orientation to the plane cannot safely be used for orientation to the earth.

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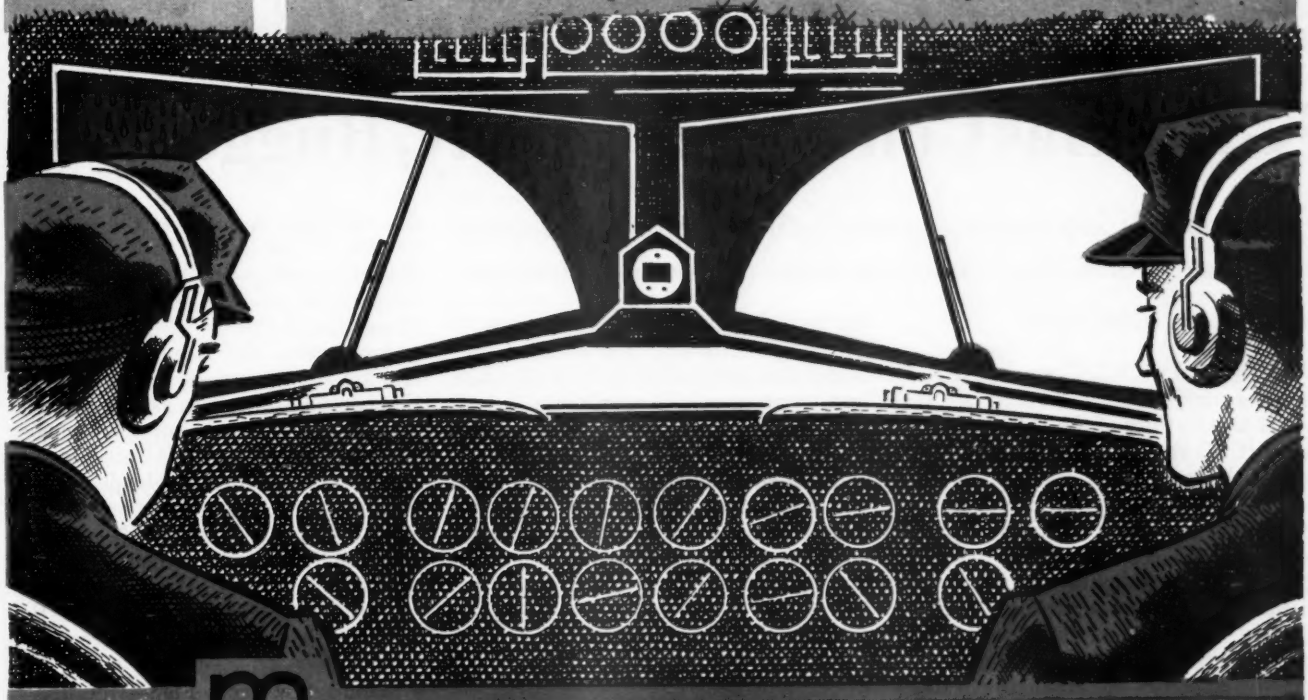

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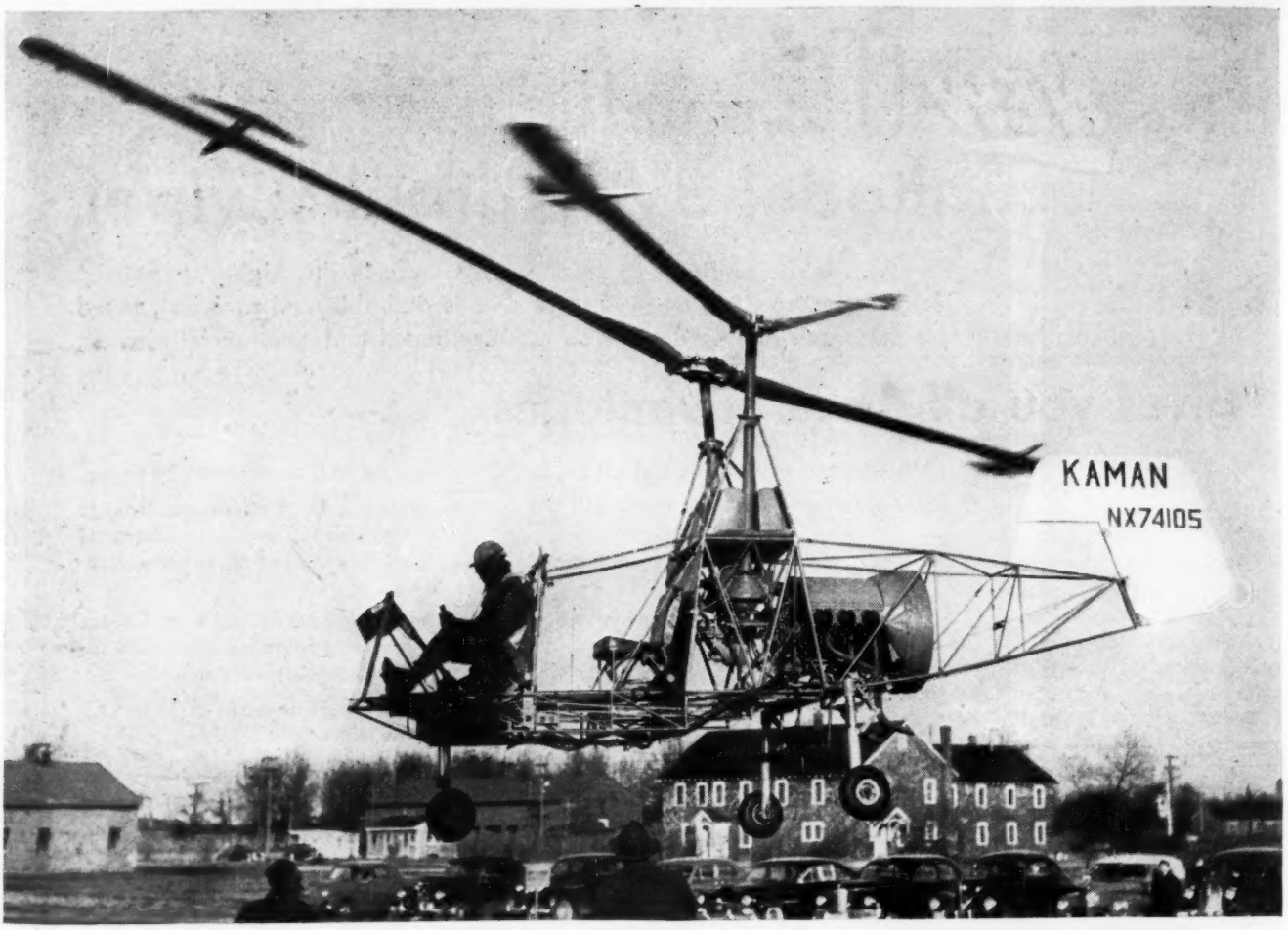


K-190 Has Control Simplicity, Ruggedness

Kaman's intermeshing-rotor, utility copter emphasizes ease of handling, inherent stability, low maintenance.

By Irving Stone

WINDSOR LOCKS, Conn.—Easy control and precise maneuverability are the impressive features of the K-190, Kaman Aircraft Corp.'s novel, intermeshing-rotor helicopter.

The ship already has structural approval and is now in the final stages of tests for CAA certification.

▶ **Operation Highlights**—Specifically designed for utility in agricultural and industrial applications, this rotary wing craft exhibits essentially instantaneous control response—an important feature in tight handling.

It displays a wide margin of reserve power, very rapid acceleration and deceleration, and an ability to go through and recover quickly from abrupt maneuvers without noticeable oscillation.

Another operational highlight reportedly is its ability to hover practically motionless in gusty wind, with very little pilot correction.

The autorotational characteristics of the craft demonstrate desirable safety in emergency letdown. Autorotative rate of descent is specified to be 1100-1200 fpm. at gross weight condition.

It is expected that the craft will be certified for a zero roll autorotation landing—a distinct advantage in a rough field.

Economy of maintenance—a prime consideration from a copter operator's point of view—would seem to be an unusual feature of the K-190. It is reported that in approximately 320 hr. of running, there has been no replacement of parts. This is attributed to the craft's rugged makeup.

▶ **Novel Flap Action**—Key factor in the K-190 design is the servo flap, located at 75 percent radius station and serving to control pitch of the blades. The blades are fabricated from a block of laminated spruce planks and mounted torsionally rigid at the root. To reduce flap movement there is a positive built-in blade angle.

With flap action, the blade twists from the root to the flap location and this changes the pitch of the outer 25 percent of the blade, with a gradient inward toward the root. It is this outer 25 percent which gives approximately 75 percent of the lift.

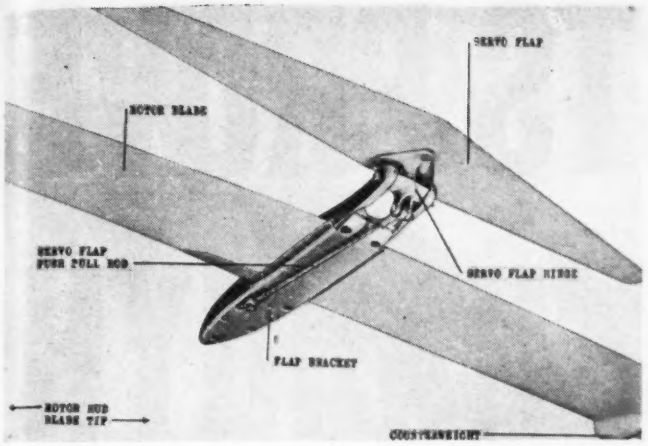
Apparently, the flap and rotor system are not as weak as this twisting action would seem to make it. This is because the relatively low pitch change is carried through a 12-ft. beam, resulting in very low torsional blade stresses.

Proof of the low stresses are claimed to have been substantiated by strain gage studies at critical condition (low rpm.-high gross weight). These investigations are reported to indicate that blade life is not dictated by stress limitations.

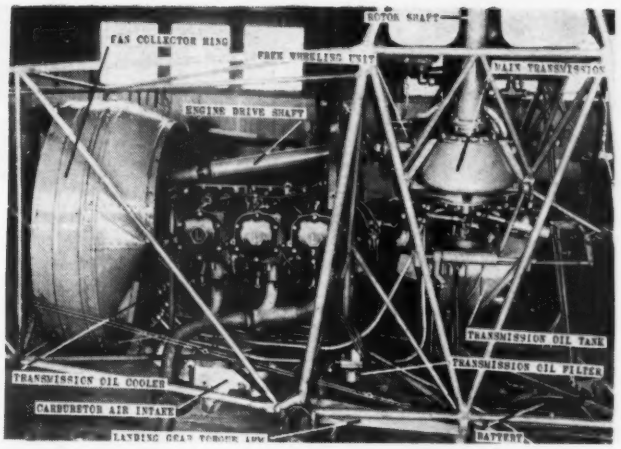
▶ **Stabilization From Flap**—Mounted at the rear of the rotor blade, the servo flap tends to move the center of pressure of the blade rearward, improving the flutter characteristics of the rotor by producing a stabilizing force.

This stability is reported to be so pronounced as to give the impression of a rotor system with large dampening, and it is obtained with no sacrifice in control response.

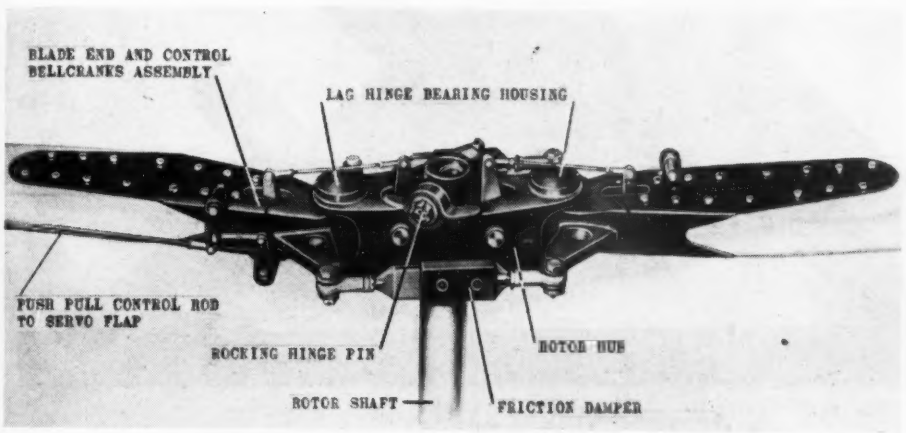
Stabilizing action of the flap has al-



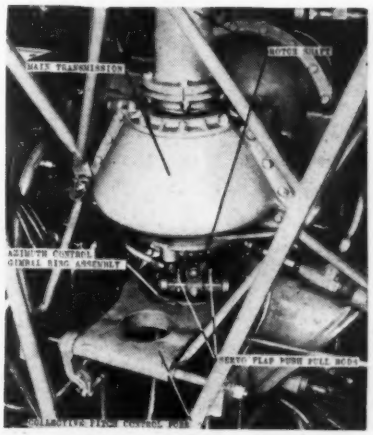
Rear, underside view of servo flap.



Engine and transmission arrangement.



Rotor hub and blade installation.



Control, transmission details.

lowed the use of a high lift airfoil, a modified Clark Y. This affords a slight increase in hovering performance in keeping with the salient function of the craft—to give slow-speed, high-lift efficiency.

The servo flap control has greatly simplified the entire control system. Eliminating blade pitch change bearings has resulted in the use of simple, rugged, and inexpensive rotor head.

Rotor hub is a see-saw type employing blade lag hinges. Inter-blade motion is dampened through the use of friction type dampers.

▶ **Control Connections**—Pilot controls are conventional. There is a cyclic stick, collective stick incorporating the throttle, and rudder pedals. Control is transferred through push-pull rods inside the hollow rotor shafts, through bellcranks at rotor hub to push-pull rods located in the blade leading edge, and finally through a bellcrank in the servo flap bracket to the flap hinge.

Cyclic control is obtained by tilting the gimbal ring assembly, thus causing a rocking motion which is carried to the servo flap as the gimbal ring turns with the rotor.

Collective pitch stick movement raises and lowers the two gimbal ring assemblies simultaneously via hinged collective pitch forks. This provides equal pitch increase or decrease to all servo flaps during the full 360-deg. rotor sweep.

Rudder pedals raise and lower the two gimbal ring assemblies alternately by means of the collective pitch forks. This movement increases the collective pitch of one rotor while decreasing that of the other. This provides a torque differential between rotors which is utilized for directional control.

In addition, rudder pedals are connected to a movable tail surface which affords increased maneuverability in forward flight and positive directional control in autorotation.

▶ **Engine Details**—Powerplant, located below and to rear of main transmission, is a 6-cylinder, air-cooled Lycoming O-435, with maximum rating of 190 hp. at 2550 rpm.

Fuel supply is by gravity feed from two interconnected tanks (total capacity of 32 gal.) located fore and aft of the rotor shafts above the transmission.

Location of the engine places it close to the craft's c.g. and provides easy access for maintenance and replacement.

Tailcone is held to engine mount bay by four bolts. Removal of these bolts and disconnection of rudder cables permits disassembly of the tailcone as a unit from the main structure.

Cooling is accomplished by a 35-in.-dia. fan splined to the propeller shaft and surrounded by a collector ring which directs air to the engine cooling pressure box.

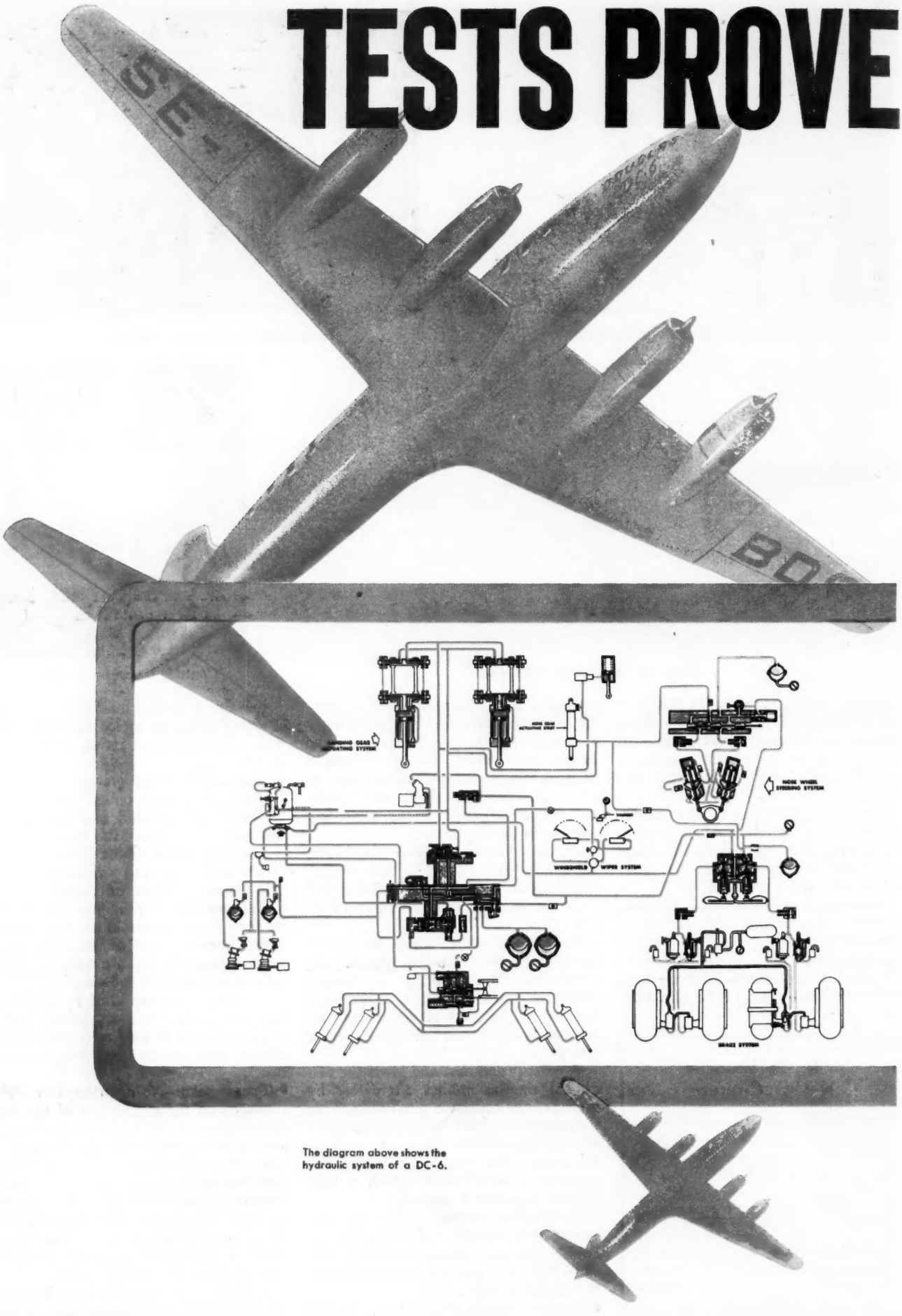
▶ **Transmission**—A centrifugal clutch mounted on the engine side of the fan disk engages at 1200-1500 engine rpm. and drives a simple spur gear transmission mounted on the engine nose. This nose transmission, with 1.1:1 gear ratio, transmits power to the drive shaft which in turn, drives the main transmission via a free wheeling unit. The drive shaft is universally mounted at both ends to allow for misalignment.

A single disk hydraulic rotor brake is located on the main transmission at the

Basic Data K-190 Copter

Empty weight	1700 lb.
Gross weight	2500 lb.
Useful load	800 lb.
Seating capacity—pilot and two passengers	
Fuel capacity	32 gal.
Engine	190-hp. Lycoming O-435
Range	235 mi.
Operational ceiling	11,000 ft.
Cruising speed	70 mph.
Top speed	95 mph.

TESTS PROVE



The diagram above shows the hydraulic system of a DC-6.

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SUPERIOR LUBRICANT for moving parts of system. Pumps last more than twice as long as with ordinary petroleum hydrocarbon fluids. Economical because it lasts longer . . . parts serve longer.

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free wheeling unit to stop the rotor quickly after engine shutdown.

Main transmission gear ratio is 10.5:1. Together with the 1.1:1 ratio of the nose transmission, this gives a ratio of 11.55:1 between engine and rotors. Change in ratio between engine and rotor speed is afforded by replacement of inexpensive spur gears in the nose transmission only.

Lubrication for nose and main transmissions are separate from the engine lube system. Nose gears are splash-lubricated, and cooling is afforded by position of nose transmission directly behind the fan.

Main transmission lubrication is by oil pumped from its oil tank. The pump is driven by the transmission itself and so gives full pressure lubrication during autorotation.

The system includes a high capacity radiator, mounted on the side of engine cooling fan collector ring.

Rotor shafts are two-piece units, flange-bolted just above the main transmission to facilitate removal and installation. Shafts are chrome-moly tubes with the mating flange welded at the bottom and a cross tube for the hub drive welded at the top.

► **Airframe**—Structure is welded chrome-moly steel tubing. Layout of the center section allows removal of the transmission without disturbing the engine.

Installations forward of the center section are supported by a platform, and are readily accessible.

A standard engine mount ring, integral with the center section, uses five Lord mounts.

Because the airframe is so substantial, it is believed by company engineers that it will be feasible to increase the gross weight of the craft from 2500 to 3000 lb. without change in structure, or components. (This would require a higher horsepower engine but since the powerplant now installed exhibits ample reserve power, it is felt that addition of 10-20 hp. by "souping" will allow the increase to the higher gross weight.)

Main landing gear cross member is a single-piece 3-in.-dia. tube connected to the structure by two journal type retainers. Two torque arms connected to the center section lower longerons prevent rotation of the landing gear cross member.

Main and nose landing gear shock struts are air oleo. Nose gear is full castering with a centering device to assure proper wheel position for running landings.

Production plans for the K-190 call for an initial output of 20 craft. Already, orders for about six of the copters have been received, and airframes for some of these are now being constructed.

Price of the helicopter is scheduled to be $25,000.

NEW AVIATION PRODUCTS

Servo Test Instrument

Type 5 "Servo Analyser" made by **Flight Research Engineering Corp.**, Richmond, Va., is general purpose servo test instrument used for measuring dynamic response of d.c. or 400c. a.c. servomechanisms, servo amplifiers, and networks. Disturbing and reference voltages for obtaining frequency response or transfer function are provided over frequency ranges of from 1/10 to 6 cps. and 1 to 60 cps. Disturbing and reference outputs may be changed from suppressed carrier 400c. voltages to sinusoidally varying "d.c." voltages by turning panel switch. When connected to servo system under test it provides data only obtainable by lengthy computations or graphical methods.

Grooves Runway Joints

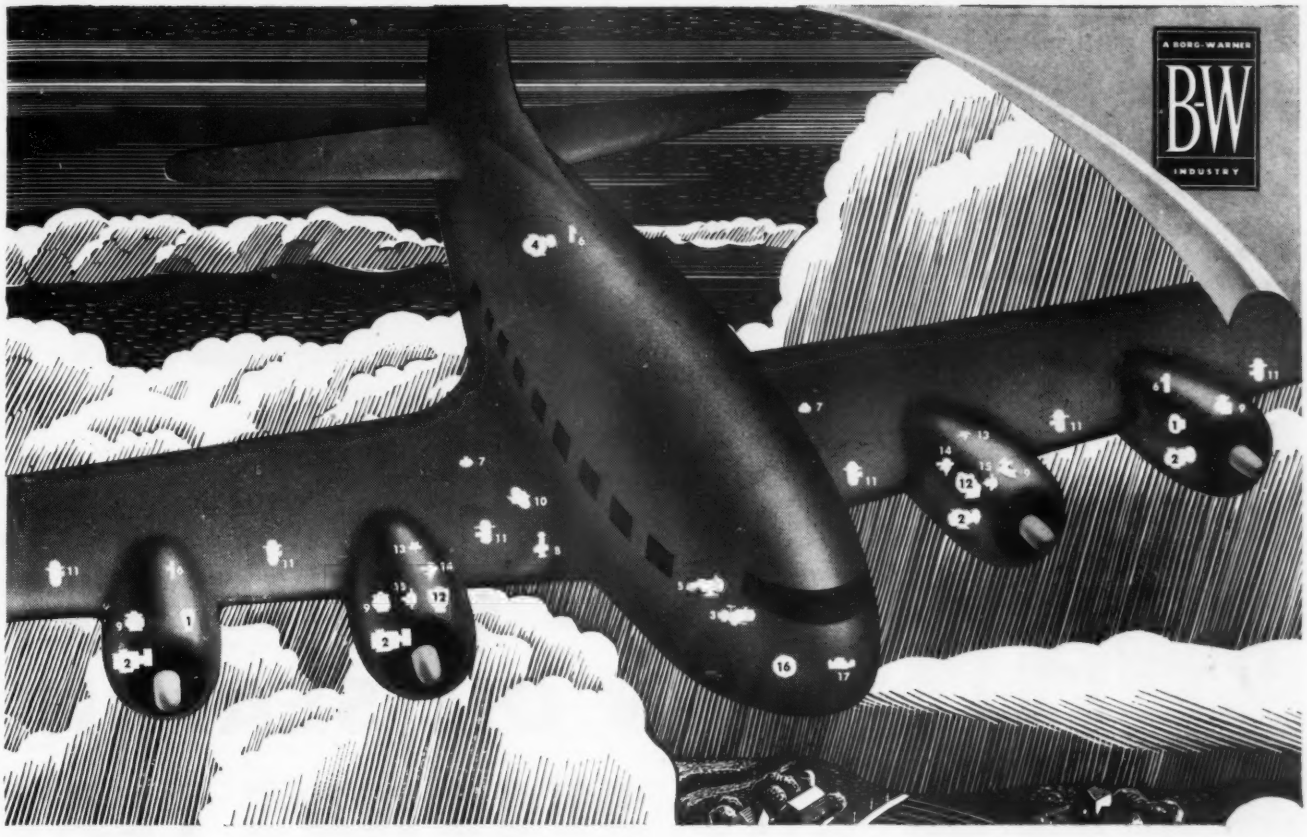
To save time and give better results in airport runway-joint maintenance, high speed concrete grooving machine is announced by **G. H. Tennant Co.**, 2520 N. 2nd St., Minneapolis, Minn. Equipment rapidly removes old seal and simultaneously cuts clean, correctly profiled groove to allow tight bond with new sealing material. Capacity is reported at about 5,000 to 20,000 ft. per day, speed depending chiefly on type of concrete, size and condition of joints, width and depth of desired cut, local traffic conditions, and skill of operator. Machine is powered by a 13.3-hp. air-cooled Wisconsin gas engine, equipped with self-starter, generator and storage battery. Cutting action is via series of 4-in. forged tool steel cutters mounted on heavy steel head revolving at 2400 rpm. By changing cutter spacing, joints or fissures from ⅜ to 2¼ in. wide can be cleaned, regrooved to desired dimensions. Depth of cut is about 1¼ in. Weight of machine is under 700 lb.

Utility Compressor

Suitable for small service shop, portable air compressor made by **DeVilbiss Co.**, 300 Phillips Ave., Toledo 1, Ohio, weighs but 32 lb. and can be operated from wall plug. Unit can hold large capacity spray gun at 35 lb. pressure and delivers smooth, continuous flow of air with power and volume ample to apply spray materials without excessive thinning. As general utility device, it can be used as handy pressure air supply. Compressor is available separately or with complete spray outfit.

Soldering Set

Light duty, 450w. "Thermo-Grip" soldering tool is designed to conserve power, drawing current only when in direct contact with the part worked on. Made by **Ideal Industries, Inc.**, Sycamore, Ill., device completes the secondary power circuit upon touching work and causes part to heat almost instantly. Handy thumb switch permits close heat control. Complete set of implements includes plier attachment for sweating and unsweating copper tubing, soldering lugs, terminals and other work of that type; fork attachment with two 3-in. electrodes for reaching into restricted places; pencil attachment with one 3-in. carbon electrode for spot and light seam soldering. There are two soldering heats, 5.3 and 4.2v.



Here are the 36 places on transport planes where Pesco PRECISION Equipment is used

Ever since manual operation of aircraft mechanisms became inadequate, Pesco has been specializing in building fuel and hydraulic equipment for America's commercial and military planes.

From the days of the first hydraulic pumps to today, when you will find Pesco equipment in 36 places on our large air liners, the design and construction of this equipment has been guided by the exacting requirements of the aircraft industry. Because plane performance and human lives have been at stake, there has been no compromise with top quality and performance.

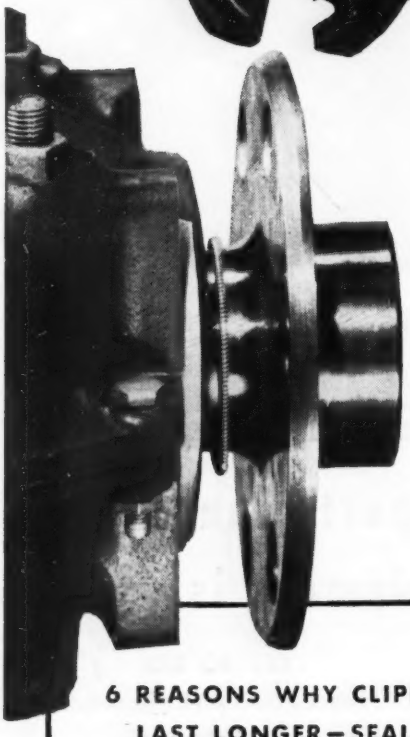
That's why Pesco developed "Pressure Loading" for hydraulic pumps, an exclusive patented feature that automatically compensates for wear and maintains highest operating efficiencies over a wide range of temperatures and altitudes. That's why Pesco designs and builds its own electric motors . . . so that all electric motor-driven units are an integral part of the hydraulic or fuel unit, insuring top operating efficiency. That's why, today, America's leading builders of jet engines have *standardized exclusively* on Pesco high-pressure fuel pumps.

Take advantage of this engineering skill and "know-how". All the facilities of Pesco . . . the largest manufacturers of specialized aircraft fuel and hydraulics in the world are at your service.

KEY TO THE Pesco Precision Equipment indicated above:

1. Engine-driven hydraulic pump.
2. Propeller feathering pump.
3. Oil transfer pump.
4. Surface control booster pump.
5. Electric motor-driven hydraulic pump.
6. Hydraulic pressure relief valves.
7. Hydraulic flow equalizer.
8. Pressure reducing valve.
9. Engine-driven fuel pump.
10. Motor drive fuel transfer pump.
11. Fuel Booster pump.
12. Engine-driven vacuum pump.
13. Oil separator.
14. Suction relief valve.
15. Air pressure relief valve.
16. Electric Motor for Cabin ventilator.
17. Cabin heater fuel pumps.

Pesco PRODUCTS DIVISION
BORG-WARNER CORPORATION
11610 Euclid Ave. · Cleveland 6, Ohio
MANUFACTURERS OF BW SUPERCHARGERS



HOW TO INSTALL AN OIL SEAL IN 10 SECONDS FLAT

■ It *can* be done—even on an inaccessible shaft like the one pictured here—with a Johns-Manville split-type Clipper Seal. Just three simple steps complete the job:

(1) Hook the detachable garter spring around the shaft. (2) Spread the seal apart at the split as shown above, and slide it over the shaft. (3) Slip the garter spring inside its groove in the seal and press the assembly into the cavity.

That's all. Installation is actually a matter of seconds. Costly "down time" is reduced to a minimum. And you can remove the seal just as quickly and easily . . . and without damage.

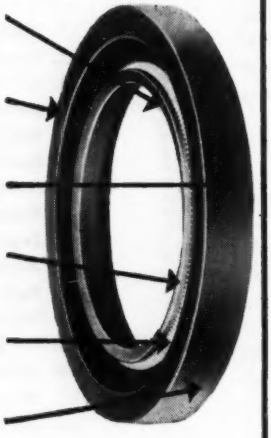
Completely new in principle, Clipper Seals have no metal case. Their rigid heel and soft flexible lip are moulded into a single unit to provide a seal of superior lubricant-retaining, dirt-excluding qualities. The garter spring adjusts lip pressure, contributes to more effective sealing and longer life.

Clipper Seals are made in both split and endless types and are available for shafts up to 66″ in diameter. They are recommended for sealing against oil, grease, water, air, grit and coolants at operating temperatures up to 450° F.

For further information, write for brochure PK-31A. Address Johns-Manville, Box 290, New York 16, New York.

6 REASONS WHY CLIPPER SEALS LAST LONGER—SEAL BETTER

1. Various durometer lip stocks are available in a variety of designs to meet many different working conditions.
2. Clipper Seal's rigid heel provides a press fit in the cavity assuring a leak-proof joint at this point.
3. Clipper Seal's non-metallic moulded body is highly resistant to most forms of corrosion.
4. Every Clipper Seal has the same accurate concentricity because the I.D. and O.D. are moulded concentrically.
5. Action of garter spring adjusts lip pressure to provide more effective sealing and longer seal life.
6. Tough, one-piece construction permits easy removal without damage so that the seal can be used again.



Johns-Manville PRODUCTS for the AVIATION INDUSTRY

Packings and Gaskets • Friction Materials • Insulations • Asbestos Textiles
Transite Conduit • Transite Pipe • Industrial Building Materials

PRODUCTION

Sellers Index

Munitions Board issues list to tell producers where services buy.

A new index of military procurement, issued by the Munitions Board in Washington last week, is designed to be a useful tool to every manufacturer who sells products to the Air Force, Navy or Army.

Approximately 90 major products now included in the coordinated purchasing program of the three services are listed with indication as to which military purchasing office has been assigned responsibility for procurement of each item. These include most of the principal items now purchased by the services.

►**One For All**—In some cases one service buys for all three and in other cases a joint purchasing setup is arranged. As examples: Air Force buys all photographic equipment, Navy buys all hand tools, and Army buys automotive equipment, while Armed Services Petroleum Purchasing Agency buys petroleum, oils and lubricants for all three departments.

Products listed include all purchasing assignments in effect as of Jan. 1. Assignments to each service were based on agreements reached between several committees on which all three services were represented. Final decisions came from the procurement policy council, composed of Maj. Gen. E. M. (Pop) Powers, USAF; Rear Adm. M. L. Ring, Navy, and Maj. Gen. D. Noce, Army.

Principal aviation purchasing offices:

AF-1—Procurement division, Air Materiel Command, Wright-Patterson AFB, Dayton, Ohio.

N-1—Bureau of Aeronautics, Navy Department, 18th St. and Constitution Ave., Washington, 25, D. C.

N-7—Naval Aviation Supply Office, Oxford Ave. and Martins Mill Road, Philadelphia, 11, Pa.

All three of these offices have assignments to purchase aircraft engines, propellers and air frames.

AMC Procurement division also purchases airborne rigid lifeboats, all cameras, films, and photographic equipment except medical X-ray films, and the Naval Aviation Supply Office purchases chronometers, and clocks (spring and electric, including movements and parts).

Ordnance purchasing offices of interest to aviation concerns and the products they purchase include:

A-12—Picatinny Arsenal, Dover, N. J.: Bombs, fin assemblies and sub-assemblies, demolition and shaped charges; fuses, mechanical, time and V. T.; rockets, mines, signals, grenades and components.

A-10—Frankford Arsenal, Philadelphia, 37: Fire control equipment, and fuses, mechanical, time and V. T.

A-9—Rock Island Arsenal, Rock Island, Ill.: Rocket launchers, machine guns except air; 60 caliber machine guns, trainers.

A-11—Springfield Armory, Springfield, 1, Mass.: Machine guns 30 to 50 cal. air; small arms.

A-13—Watervliet Arsenal, Watervliet, N. Y.: Guns, howitzers, mortars and rifles, 20-mm. and above.

N-5—Bureau of Ordnance, Navy Dept., 18th St. and Constitution Ave., Washington, 25, D. C.: Bombs, fins and sub-assemblies; fuses, mechanical time and V. T.; high explosives, propellants, blasting agents, supplies and miscellaneous explosives; mines, naval and aerial and components; pyro powder, rockets, mines, signals, grenades and components.

Construction and excavating equipment for airports and the products they include are purchased by:

A-1—Chicago procurement office, Army Corps of Engineers, 226 West Jackson Blvd., Chicago 6, Ill.: Excavating and dredging equipment, road-making machinery (bituminous mixing, paving and related equipment); road and pavement repair, marking, leveling and demolition equipment; stabilizing, compacting and soil preparation equipment for roads and streets; agricultural machinery and implements including tractors, earth moving equipment.

Copies of the complete index, printed on a single sheet for handy reference and designed to make contacts with the services easier for business having products to sell, may be obtained by writing Munitions Board, National Military Establishment, Pentagon Bldg., Washington 25, D. C.

Navy Announces New Allocations

Navy announced allocation of $72,207,000 in additional fiscal 1949 funds for aircraft and equipment procurement. These funds were the major part of an $80-million allocation certified for expenditure last week by President Truman.

With these funds the Navy will buy: 120 Vought Corsairs (F4U-5N) for $30,669,000; 9 Bell HTL helicopters for $634,000; 16 Lockheed TF-80C for $4,015,000; 1 Goodyear ZPN airship for $3,388,000.

Additional authorizations: $16,322,000 for plant facilities; $6,366,000 for aviation electronic equipment; $9,800,000 for modifications and purchase of additional spare parts; and $1,003,000 for a guided missiles. Allocation of the remaining $7,793,000 will be announced later.

Canadian Firm Moves

Canadian Car and Foundry Co., Ltd. has moved its aircraft manufacturing activities into new quarters in Montreal. It formerly occupied leased facilities nearby but has purchased its own buildings. Cancargo Aircraft Manufacturing Co., a subsidiary, will soon begin operations at Dorval Airport with the manufacture of the "Loadmaster," a twin-engine cargo aircraft designed by Vincent J. Burnelli.

Canadian Car and Foundry is currently overhauling a large number of North American "Harvard" trainers for the Royal Canadian Air Force and will manufacture the "Norseman," a large, single-engine cargo airplane designed by Robert Noorduyn.

Coolers for British

Standard-Thomson Corp., Dayton, Ohio has completed negotiations for the manufacture of aluminum oil coolers and radiators for British aircraft and has designated Hawker-Siddeley Aircraft Co., Ltd. as British sales agent and licensee. John E. Golob, Standard-Thomson vice president and general manager, is studying the possibility of building Standard-Thomson plants in either England or Canada to supply coolers and equipment to British contractors.

Hell Diver Overhaul

Navy is overhauling 284 Curtiss SB2C-5 Hell Diver bombers at Naval Air Station, Corpus Christi, Tex. A portion of the planes are those withdrawn from storage pools and all planes are being completely disassembled and rebuilt incorporating numerous modifications. The bombers will be assigned to various reserve units throughout the country upon completion.

C-46 Overhaul

Grand Central Airport Co., Glendale, Calif., has been awarded a $2,500,000 Air Force contract for reconditioning 100 C-46s. All 100 planes, which are now in storage at Walnut Ridge, Ark., are scheduled to be ready for the USAF by Sept. 30. Grand Central completed overhaul on 100 C-46s for the Chinese Air Force last August.

Some Short jottings for airline operators, charter companies, and V.I.P.s

Sea Island Service

B.W.I.A.'s Sealands will operate twice-weekly over this main route, with 'flag-stops' at the smaller islands. Dominica and St. Vincent are sea-dromes.

The Sealand is chosen

Trinidad, on the border of the Caribbean, is the key to new territory served by the amphibian Sealand. B.W.I.A., the subsidiary of B.S.A.A.C., have recently ordered three of these versatile aircraft for general duties among the West Indian Islands.

They could not have made a better choice.

The Sealand, which is equally happy on land or sea, is the perfect aircraft for an area where landing strips are few and far between.

B.W.I.A.'s new 'Sea Island Service,' which will operate daily between Trinidad and the Windward and Leeward Isles, will call upon the Sealand for all kinds of work.

For Itself

All kinds of work? Yes, because Shorts have specially designed the Sealand as the most easily convertible amphibian on the market.

Mooring the Sealand is a simple operation carried out entirely by the pilot.

It can be used for the rapid transport of passengers or freight, as a luxurious flying office, or as an air ambulance. In any of its roles it will give the greatest service at the lowest cost.

The Sealand's range is elastic. With 54 gallons and a payload of 1,400 lbs. — which is equivalent to seven passengers and baggage — the Sealand can cover nearly 350 miles at a speed of 150 m.p.h. But 120 gallons of fuel, and 994 lbs. of freight, give it a range of 765 miles. The Sealand's reversible pitch propellers endow it with high manoeuvrability in the most congested waterways. It has a take-off run of 550 yards and climbs at 880 ft. per minute.

These are only a few reasons for its immense value to charter companies and feeder lines.

For Others

On the 'Sea Island Service' the Sealand needs no great range. It will be used for short hops from island to island, providing a much-needed means of inter-island transport.

But consider its practical value to plantation owners and estate-managers who need a general 'hold-all' to take them and their stores to outlying districts. In this case, the Sealand, with a petrol consumption of 6 ground miles per gallon, is the answer to many of the executive's problems. If you have scattered estates, not easily accessible by overland routes, Shorts are confident that the Sealand can be adapted to your needs. Why not ask Shorts for details?

FLYING BOAT PERSONALITIES

Captain

J. S. SHEPHERD

T.E.A.L

Captain J. S. Shepherd has been on the staff of Tasman Empire Airways Limited since 1945, but his flying career dates from 1939. He trained in Canada and served with No. 228 Squadron in Scotland, and in West Africa with No. 490 Squadron. He returned to New Zealand as a member of the delivery flight which flew the first Sunderland aircraft for the R.N.Z.A.F. from the United Kingdom to Auckland. He was awarded the Air Force Cross for outstanding service during the War. He is a keen sportsman, having represented Otago in provincial Rugby football matches. He is also a sprinter of some note.

Shorts THE FIRST MANUFACTURERS OF AIRCRAFT IN THE WORLD

Short Brothers & Harland Ltd., Queens Island, Belfast

London Office: *17 Grosvenor Street, W.1*

Instability May Spur Mergers

Lack of business leaves industry three choices: liquidate, diversify or consolidate. Latter seen as most logical.

Whatever investment status the aircraft industry previously enjoyed was seriously impaired by the abrupt cancellation of the Northrop and North American awards.

This surprise Air Force action highlights the extreme vulnerability of any company with the government as its sole customer. The aircraft industry always was characterized by a high degree of selectivity with shifting patterns causing rotation of leaders. Sudden cancellations and re-allocations of orders merely focus in sharper outline the highly speculative nature of the industry.

True, the partisans of Convair are now rejoicing in the company's good fortune in obtaining a sizable piece of business by sudden Air Force dictate, at the expense of other builders. But how secure can such partisans feel when it is realized that similar sets of pressures and circumstances are always at play and may result in another series of order re-alignments, this time at the expense of Convair?

▶ **Security Lacking**—In the same measure, no aircraft company can feel secure with its government business and such bookings remaining suspect by the discerning investor.

Recent shifts in aircraft awards stem from the curtailments made necessary by the Air Force as a result of President Truman's budget recommendations, although these recommendations still are subject to congressional action. The indicated funds could support only 48 Air Force groups compared to about 60 now in operation and contrasted with the 70 groups endorsed at the last session of Congress.

Completely ignored by recent official actions are the recommendations of the President's Air Policy Commission and of the Congressional Aviation Policy Board. The separate reports issued by these independent groups a year ago represented strong hopes for the aircraft builders that at long last a definite note of stability was to be introduced into the industry.

Certainly no accusations of bias greeted the final reports of the two inquiry groups. A thorough, painstaking effort was made to ascertain all of the facts and to advance long range programs which were constructive and could be supported by the country. The quality of the two groups and their sponsorship of recommendations was a major factor in slowly restoring investor confidence to the aircraft industry.

▶ **More Probes**—Other commissions and boards may be created to probe the health of the aircraft industry. Regardless of how well constituted, however, the same faith and confidence in the ultimate fulfillment of the final recommendations will be lacking. Recent reversals of policy and the consequences promise to leave their mark for some time to come.

Probably the most encouraging hope for the investor in the aircraft industry lies in the pressure for mergers and consolidations which now appear to have moved a few stages closer as a result of recent developments.

The curtailment of aircraft procurement forcibly drove home the fact that there simply is not enough military business available during peacetime to keep the entire industry profitably employed.

▶ **Plant Capacity**—There is a great excess of plant capacity to serve the present level of available business. At peak levels during the war, "on-site" airframe production was at the rate of 9 lb. per sq. ft. per year. According to testimony introduced at the hearings of the President's Air Policy Commission, the present covered floor area of the major airframe manufacturers now serving the military measured 41 million sq. ft. At 9 lb. per sq. ft. per year, this area should support a peak output of 369 million airframe pounds per year under full wartime conditions. Plants held in reserve have a total area of 21,200,000 sq. ft. Applying the same measure, they should support an additional 191 million airframe pounds per year at peak utilization. It follows that the potential industry peak airframe capacity, under conditions such as obtained in 1944 and without allowance for the contribution of the personal plane units, is approximately 560 million pounds of airframe per year.

Contrasted with this existing and potential capacity is the estimated 37 million airframe pounds which will be built during fiscal 1950 with only a slighter higher figure for fiscal 1951.

Top Air Force officials find it difficult to justify the economic existence of 15 separate major aircraft builders to compete for such a small market in relation to available capacities.

Financial observers point out that rather than await the full effects of the continuing processes of attrition that would follow the futile attempts of obtaining military aviation awards, a number of establishments, if they so desired, could salvage their resources. This could be done through any one of a series of measures: liquidation in part or whole, diversification in other industries, and consolidations or mergers.

▶ **Least Likely**—Liquidation in part or whole is the least likely of all prospects. No management is desirous of shutting off the source of its support. Even where large cash balances have been built up and are admittedly not entirely needed in the conduct of the business, special disbursements are made only under force of strong stockholder pressures.

The aircraft industry's entry into non-aviation manufacturing activities, on the whole, has proved a failure. For the most part, such diversions were financed by carry-back tax credits. No longer does a similar cushion exist to absorb excursions in non-aviation fields.

▶ **Mergers Logical**—The most logical course for the industry to follow appears the one leading to mergers and consolidations. For one thing the production facilities would, for the most part, remain intact and be available on a standby basis in case of another national emergency.

This may appear to conflict with the Administration policy of cracking down on various industrial combines in other fields. Actually, this may not be the case. True, the Justice Department frowned upon a proposed merger of Convair and Lockheed some years ago. It is not generally realized, however, that under the provisions of the anti-trust laws the Justice Department was forced to disapprove this particular combine as there was such a heavy concentration in certain types of aircraft models at that time as to endanger seriously the competitive position of the rest of the industry.

Nevertheless, there are other mergers that can be advanced which could be sanctioned by the Justice Department and the hearty approval of the Air Forces.

At the outset, there may be an understandable amount of coyness among the separate aircraft builders. Strong economic forces, however, may dictate changes in attitude and the opposition to consolidations may wear away. Such realistic re-casting of the industry's facilities should make for a stronger group capable of withstanding the shifting tides so peculiar to aircraft manufacturing.

—Selig Altschul

Cessna In Front

High dollar volume, airplane shipments, are reported in 1948.

By Alexander McSurely

Cessna Aircraft Co. boosted dollar volume of its 1948 personal airplane sales $700,000 above the dollars total for 1947, and took a strong lead among light plane manufacturers in a year which saw many light plane company reverses.

Dwane L. Wallace, Cessna president, reported a 1948 sales total of $6,752,156 on a net billing price basis. Cessna also led all other personal plane manufacturers in the number of planes shipped with a total of 1631 planes. (Piper Aircraft Corp., nearest competitor, was 200 planes behind Cessna.)

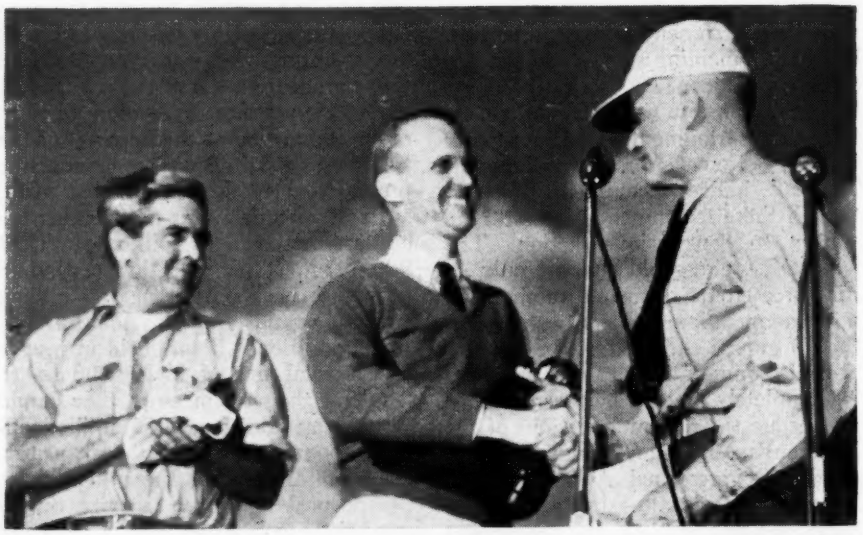
▶ **Tribute**—At the recent Cessna annual distributors' meeting at Wichita, Wallace and Don Flower, sales manager, paid special tribute to the Top-Flight Club, composed of the 10 distributors who showed the largest sales volume. Included: Mauk's Airpark, Blackwell, Okla.; Pathfinder Flying Service, Stockton, Calif.; Yingling Aircraft, Wichita; Clinton Aviation, Denver; Walston Aviation, East Alton, Ill.; Mid-States Aviation, Northbrook, Ill.; Cassio Muniz, Sao Paulo, Brazil; Lysdale Flying Service, Minneapolis; Lynch Flying Service, Belgrade, Mont., and Aero Activities, Inc., Detroit.

A total of 40 distributors were cited for honors as members of the "Plus" Club, for doing a larger dollar volume of new airplane sales in 1948 than in the previous year.

▶ **Members** — Plus Club members, in addition to most of the Top-Flight group, included Aerial Surveys, Pittsburgh; Air Oasis of Calif., Fresno; Air Oasis of Phoenix; Cannon Aircraft, Charlotte, N. C.; Cincinnati Air, Cincinnati; Clinch Flying Service, North Platte, Neb.; Consolidated Aircraft, Ft. Wayne, Ind.; Davies Flying Service, Louisville, Ky.; Dixie Air, Inc., Tuscaloosa, Ala.; Huntington Airport, Chesapeake, Ohio; Lane Aviation, Columbus, Ohio; Kenneth Starnes Aviation, Little Rock; Straley Flying Service, Clinton, Iowa; Tomco Aviation, San Antonio; Vickers Aircraft Sales & Service, Lubbock, Tex.; Sigurd Wien, Fairbanks, Alaska; Orlando Beltran, Havana, Cuba; Commercial Air Service Ltd., Johannesburg, South Africa; Dr. Eric Scotoni, Zurich, Switzerland; Association Continentale Aeronautique, Brussels, Belgium; Aviation Services, Ltd., Moose Jaw, Saskatchewan; Rocky Mountain Air Service, Calgary, Alberta; Vancouver U-Fly, Vancouver, B. C.; Compania Aeron. Chilena, Ltd., Santiago, Chile; Arosemena Hermanos, Guayaquil, Ecuador; Aviones Centro Americanos, Ltd., Guatamala City, Guatamala; Earl L. Gardner, British West Indies; Aviones S. A., Mexico; Actividades Aereas S. A., Panama; L. W. Magruder, San Juan, Puerto Rico; Horacio Torrendall, S. A., Montevideo, Uruguay; and Carlos Tejera, Caracas, Venezuela.

The Cessna plane shipments were in addition to extensive non-aviation business done by the manufacturer in furniture, hydraulic cylinders and hydraulic systems for farm equipment, and in clothing lockers.

▶ **Parts Importance** — In the recently distributed Cessna annual report, for the fiscal year ending Sept. 30, 1948, President Wallace stated that sale of parts and accessories for Cessna airplanes was becoming an increasingly important part of the company's sales volume. At that time the company reported sales of parts and accessories,



MIAMI WINNERS

Steve Wittman (above) and Bill Brennand hold a jubilee at the conclusion of the Continental Motors Midget plane race finals at Miami, Fla., in which Wittman took first in his "Bonzo" plane and Brennand, his racing partner, finished second in the Wittman-designed "Buster" midget. The Oshkosh, Wis., team made speeds of 176.867 and 174.193 mph. respectively. Note sweepback in Wittman-designed propeller. Below, Beverley Howard, (center) Charleston, S. C., fixed base operator, and three times international aerobatic champion, receives his fourth championship aerobatic trophy presented by Maj. Al Williams, Gulf Oil aviation manager, at the Miami Air Maneuvers. At left is James Kinnucan, Continental Motors vice president and chief engineer.

The Foreman of this progressive shop (left) consults with a Gulf Lubrication Engineer on results with Gulf L.S. Cutting Base in machining clock parts.

Costs Down-Production Up!

"We've sharply reduced time per piece, improved surface finish, and greatly extended the number of pieces per tool grind since we switched to Gulf L.S. Cutting Base," says this Foreman of Main Screw Machine Products, Inc., Waterbury, Conn.

"On our new ¾" automatics we are performing two turning, one threading, and one cut off operation on a steel clock part at the rate of 1.2 seconds per piece. With the cutting oil we used previously the time per piece was much higher."

"Just as important to us has been the increased number of pieces per tool grind. With Gulf L.S. Cutting Base we are now running 16,000 pieces before regrinding of the tools is necessary. Add the fact that we are getting better finishes, and you can see why we're gratified by our experience with this fine cutting oil."

Here's another example of how the proper application of the right Gulf quality cutting oil improves production and lower costs. To make sure that you're getting all the benefits possible through the use of more suitable cutting oils, call in a Gulf Lubrication Engineer today.

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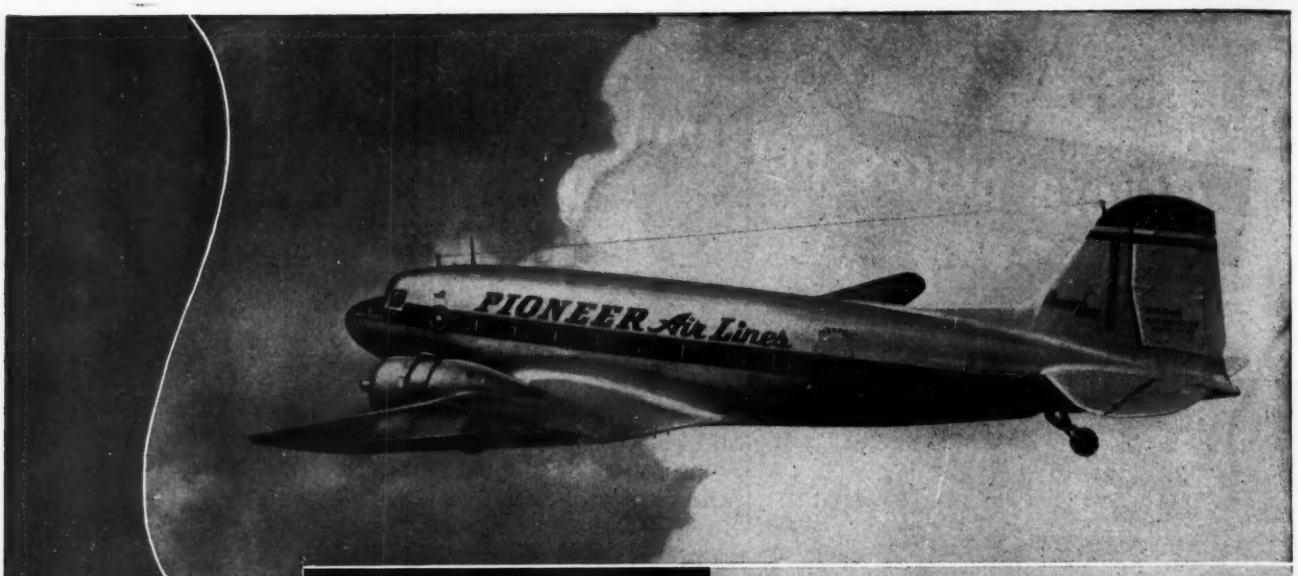

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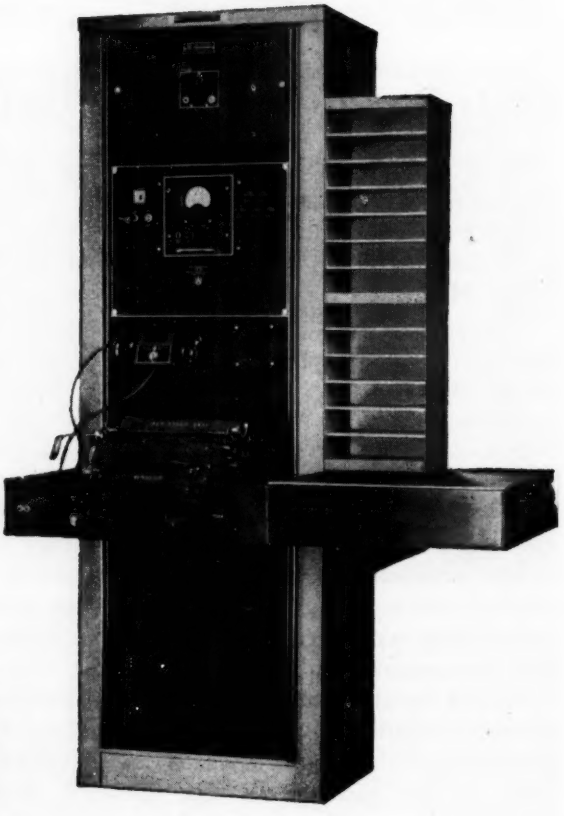
PACKAGE DESIGN SPEEDS YOUR INSTALLATIONS
The Type 378A is *complete* from microphone to antenna, ready for connection to power mains. It is designed for aeronautical VHF ground-air communications at smaller traffic centers.

PROVEN COMPONENTS INSURE QUALITY AND PERFORMANCE—The Type 305A VHF Receiver and Type 364A VHF Transmitter (50 watts) are the principal components of the 378A. Long used separately and field-tested by leading airlines, these units are now available in package form.

NEW AIDS TO CONVENIENT OPERATION
The telephone handset with its convenient push-to-talk button, serves as both headphone and microphone, with an auxiliary loudspeaker for incoming calls. The 378A includes desk front, message rack, and typewriter space—there are no accessories to be added.

LOCAL OR REMOTE CONTROL—If desired, the control panel can be removed and the 378A remotely controlled, either by re-installing the panel at the operating position or by simple adaptation to your existing control equipment.

**Pioneer aircraft are also 100% equipped with the new WILCOX Type 361A Airborne VHF Communication System.*



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for Cessna planes during the first nine months of 1948, at over $1 million.

The manufacturer reported total sales of $14,295,221 and earnings of $552,898, or 79 cents a share of stock outstanding, for fiscal 1948. It paid a cash dividend of 25 cents on Dec. 8, making the eighth consecutive year in which stockholders received a dividend.

Wallace reported that diversification of products contributed a great deal in stabilizing of employment. Cessna had 1578 employes on the payroll at the fiscal year's end, compared to an average employment for the year of 1514.

Air Scholarships

Four leading U. S. aviation technical schools are offering 20 free scholarships to air-minded young men in 11 Latin American countries, with awards to be announced in March.

Wayne Weishaar, Aeronautical Training Society secretary, Washington, who is acting as liaison representative for the scholarships, said that they were offered by Cal-Aero Technical Institute, Los Angeles; Embry-Riddle International School of Aviation, Miami; Pittsburgh (Pa.) Institute of Aeronautics, and Spartan School of Aeronautics, Tulsa.

Nations to which scholarship offers are being made include Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela, Ecuador, Uruguay, Panama and Bolivia. Grants aggregating approximately $20,000 cover tuition only, and scholarship winners will provide their own transportation to the U. S. and return, and living expenses in the U. S.

New Responsibility

Milwaukee County (Wis.) has announced that after Feb. 1 gasoline sales and tiedowns at General Billy Mitchell Field will be the responsibility of the two fixed base operators, Anderson Air Activities and Midwest Airways, Inc., and that the county will no longer handle fuel sales and tiedowns.

Announcement followed retirement of Maj. S. E. Piasecki after many years of service as manager of the principal Milwaukee airport.

1949 Cruisair

Bellanca Aircraft Corp. has announced a pricetag of $6950 flyaway New Castle, Del., on the 1949 model four-place Bellanca Cruisair. New features include redesigned instrument panel with indirect lighting; primary flight group as standard, including rate of climb, bank and turn, sensitive altimeter and clock; adjustable front seats, heaters for both front and rear seats, new color schemes.

BRIEFING FOR DEALERS & DISTRIBUTORS

MINNESOTA FIXED BASE ANALYSIS—Of 29 Minnesota fixed base operators replying to a recent questionnaire from the state aeronautics department, 18 expected their gross dollar volume for 1948 would be larger than in 1947, 11 said it would be smaller, and six said it would be about the same. The group had a total investment in buildings, aircraft, shops and accessories of substantially over $1 million, and against this had approximately $250,000 indebtedness. Continuing shortage of hangars, shops and service facilities, was seen as a major problem.

Analysis of the report indicated that major losses resulting from too rapid expansion and poorly adapted equipment have already been sustained with prospects for a slow but steady growth and opportunity for reasonably profitable operation in the next few years. Minnesota had a total of 128 fixed base operators as of Sept. 1, 1948.

MASSACHUSETTS CONVICTION—First criminal proceedings under the new Massachusetts Aeronautics Commission regulation on "misappropriation of aircraft" resulted in conviction of Edwin L. Martin, Cambridge, on charges of misappropriation and careless and reckless operation.

Frank Sweeney, chief state aeronautics inspector, presented evidence showing that Martin took a plane from the hangar at Billerica-Wilmington Airport, at 11:30 pm. Nov. 23, and attempted to takeoff with 150 ft. ceiling. He had no lights except headlights of a taxicab on the runway.

He climbed to 300 ft. and then became confused in the overcast and crashed. Plane was demolished but Martin was unhurt. He was given a three-months house of correction sentence (suspended) for the misappropriation charge, and fined $100 on the other charges.

FIRE RETARDANT COATING—Regal Air Corp., New York maker of the Re-Glo protective coating for airplanes, is more than somewhat proud of a recent testimonial from Jack Denton, Phoenix, Ariz., Stinson owner, who thinks that a Re-Glo job on his airplane probably saved his life.

Denton started to make an emergency landing on a highway near Phoenix and his left wing struck a high voltage line which caused the wing fabric to catch fire near the aileron. Instead of spreading, however, the fire remained localized and was extinguished by the slipstream. Denton flew on to land at Phoenix, and found that the heat had melted the part of the metal structure of the wing, and that the structure suffered considerable collision damage but that the flame damage to the fabric was negligible.

The manufacturer reports that laboratory tests have shown that fabric treated with Re-Glo is 30 percent slower burning and 25 percent stronger than ordinary doped fabric.

GODFREY GETS AWARD—Radio commentator Arthur Godfrey, who has been a persistent plugger for aviation in his programs and who commutes regularly in his Navion between his Virginia home and New York studios, won the 1948 National Flight System award, presented by Dick Powell, NFS president, as the private pilot who has done most to promote private flying in America.

SPORTSMAN'S SHOW—Five of the principal four-placer business and personal planes are scheduled for display at the National Sportsman's Show in Grand Central Palace, New York City, Feb. 19 through 27, all exhibited by local distributors. The planes and their exhibitors include Beechcraft Bonanza, Atlantic Aviation Corp.; Cessna 170, Personal Aircraft Sales; Piper Family Cruiser and Piper-Stinson, Safair Inc.; and Ryan Navion, Mallard Air Service.

Accessory manufacturers, suppliers and oil companies will also have aviation exhibits along with educational aviation exhibits by Air Force, Navy, and CAA.

AIR ASSOCIATES AT GRAND CENTRAL—Opening of a new Air Associates supply store and warehouse at Grand Central Airport, Glendale, Calif., has been announced. The aviation supply store formerly operated by Grand Central is discontinuing retail sales, but the Grand Central company will continue to act as distributor for the various aircraft products it has handled in the past.

—ALEXANDER McSURELY

AIR TRANSPORT

Damon Accepts TWA Presidency

Former American Airlines official joins forces with Howard Hughes, bitter enemy of overseas monopoly.

Ralph S. Damon, who resigned two weeks ago as president of American Airlines following policy disagreements with board chairman C. R. Smith, has been elected president of TWA.

In his new post, Damon will be in a strategic position to combat AA's proposed sale of American Overseas Airlines to Pan American Airways. It was this deal which brought the final break between Damon and Smith.

As TWA president, Damon succeeds LaMotte T. Cohu, who resigned last June 1 to become president and general manager of Consolidated Vultee Aircraft Corp. Since Cohu's departure, Warren Lee Pierson, TWA board chairman, has been in overall charge of the carrier's policies and operations.

▶ **Long Friendship Cited** – Howard Hughes, who has a controlling interest in TWA, finally prevailed on Damon to accept the new post. A friend of Damon's for many years, Hughes said he had long cherished the hope of bringing the former AA executive into the TWA organization.

"Last summer, after the resignation of LaMotte Cohu, I immediately thought of Ralph Damon as my first choice to succeed Cohu," Hughes declared. "However, I was aware of Damon's intense feeling of loyalty to American Airlines, and I felt that any approach from me would be unwelcome."

"Then," Hughes continued, "I began hearing reports of Damon's dissatisfaction with the impending sale of American Airlines' overseas division to Pan American Airways. Finally, I heard that Damon had made up his mind to resign in protest over this transaction. I immediately contacted Damon and invited him to come to Los Angeles for a talk.

▶ **Both Chosen Instrument Foes**–"He did so, and I found that, in addition to our long-standing friendship, we shared a feeling against the so-called 'chosen instrument' (favored by Pan American). I asked Damon if he would consider the presidency of TWA. This led to further meetings between us, and finally Damon informed me he was willing to accept."

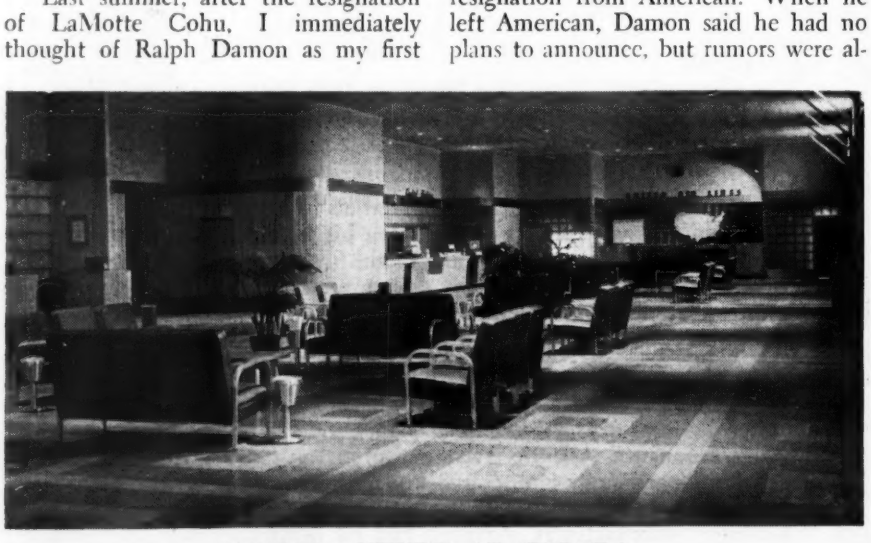
Damon's decision to take the TWA post came five days after his formal resignation from American. When he left American, Damon said he had no plans to announce, but rumors were already current that he would go with TWA (AVIATION WEEK, Jan. 24). A special meeting of TWA's directors in Kansas City elected Damon to the company's presidency barely 24 hours after he told Hughes he would accept. Damon will take office Feb. 10.

▶ **Salary Increase Reported**–It is understood that Damon's salary with TWA may make him the highest paid executive in the air transport industry. During 1947, latest year for which figures are available, C. R. Smith had the industry's highest annual salary–$60,000. Damon received $40,000 during the same year.

Hughes, who has been a bitter foe of the "chosen instrument," characterized the idea as a "proposal fostered by certain individuals for the elimination of competition in overseas air transportation and for the creation in its place of one gigantic trust or monopoly. Damon and I see eye to eye on this issue," Hughes declared.

▶ **Strategy Planned**–Even before Damon resigned from American, TWA was working out its strategy to combat American Overseas Airlines' sale to Pan American. As one step in preventing the case from easing through CAB's legal machinery in a hurry, TWA intends to ask the Board to re-examine the whole North Atlantic route structure as part of the proceeding.

A prehearing conference on the AOA-Pan American route transfer proceeding was held by CAB on Jan. 14–only a month after the case was docketed. A formal hearing on the proposal is tentatively slated for early March, but a hitch may develop in the Board's highly-expedited timetable for considering the case.



LOBBY LUXURY AT TOLEDO

The new $175,000 airport terminal at Toledo, O., rivals any similar structure in the U. S. from the standpoint of design and decoration, according to airline officials who have inspected the building. Housing the ticketing and passenger handling facilities of four airlines, the terminal also accommodates the office of the aviation commissioner, a restaurant, snack bar, gift shop, freight terminal and observation deck. Structure is part of a $750,000 airport improvement program financed jointly by the city of Toledo and the Civil Aeronautics Administration. Lobby has walls of statuary bronze trimmed with blue, modernistic leather covered furniture and indirect lighting. Glass brick is used extensively. United Air Lines and Capital Airlines ticket counters are shown.

Feeder Activation Awaits RFC Loan

Plans for activation of the nation's largest feeder network are wrapped up closely with expected early action by the Reconstruction Finance Corp. on a $600,000 loan application.

Parks Air Lines, which was awarded 4000 miles of short-haul routes in three separate CAB decisions during 1946 and 1947, had hoped to start service on part of its system last spring. But informal and formal negotiations for RFC aid have been in progress nearly a year without a final decision.

Actual application for the RFC loan was made by Parks Aircraft Sales and Service, Inc., which controls the feeder. As first drawn up, Parks' bid for aid apparently was not satisfactory to CAB, and, therefore, not acceptable to RFC.

▶ **Approval of Control Urged**–Details of the feeder's financing plans were discussed in a recent CAB examiner's re-

port which urged the Board to grant conditional approval to the proposed acquisition of all Parks Air Lines stock by Parks Aircraft Sales and Service, Inc. The examiner said that unless prior sanction has been obtained from CAB, commercial transactions between Parks Aircraft and Parks Air Lines should be restricted. He added that Parks Aircraft should not sell its own stock to raise funds for the feeder without first obtaining CAB approval.

Parks Aircraft plans to convert the DC-3s which Parks Air Lines would use on its feeder links. This transaction would involve between $100,000 and $200,000. In addition, Parks Aircraft would service the feeder's planes at a cost estimated between $5000 and $6000 monthly.

▶ **Stock Sale Proposed**—The parent company's attempt to borrow $600,000 from RFC is subject to the condition that half of the money would be lent to the airline and the other half invested in the carrier's stock. After activation of the feeder's St. Louis-Chicago and Chicago-Sioux City, Ia., links with RFC aid, additional funds needed to open other routes would be obtained by selling stock in either Parks Air Lines or Parks Aircraft.

Parks' system extends as far south as Memphis and Tulsa, north to Chicago and the Twin Cities, west to Sioux City and east to Indianapolis. If RFC refuses to make the $600,000 loan, Parks hopes to be able to finance the feeder operation through sale of about $2 million worth of real property, including airports.

All-time High

Air mail volume hit an all-time high at the close of 1948, with the relatively-new air parcel post service contributing importantly to the upward trend of air mail traffic.

Preliminary reports indicate that December's air mail traffic may have exceeded 14,000,000 lb., against 9,116,693 lb. in the same 1947 month. Air mail dispatched in the first 11 months of 1948 aggregated 84,779,258 lb., and exceeded the volume for all of 1947 by over 4,000,000 lb.

Nonsked Enjoined

Modern Air Transport, uncertificated carrier active on the New York-Miami-Puerto Rico run, has been enjoined by a Federal court from continuing regularly scheduled operations in violation of the Civil Aeronautics Act. The case was one of several being prosecuted by CAB attorneys in an effort to force irregular lines to restrict the frequency and regularity of their services in accordance with the nonscheduled exemption.

Low Fares Rouse New Protests

United and Eastern believe bargain tariffs are not enough to cover depreciation and overhead costs.

Continued efforts by individual airlines to generate more passenger business with lower rates have stirred strong new protests from carriers trying to maintain their current rate structure.

United Air Lines and Eastern Air Lines are sparking opposition to the trend toward bargain tickets. They believe that some of the tariffs proposed by their competitors are economically unjustifiable, possibly providing sufficient revenues to pay out-of-pocket costs, but not enough to cover depreciation and overhead.

▶ **Careful Study Urged**—The 10 percent industry-wide fare hike instituted with CAB backing late last summer has been so diluted by subsequent reductions that United has found its net revenue gain is only 1.5 percent. With basic fares up only 3.5 percent since 1941, against a 70 percent rise in costs, UAL is urging careful studies of cut-rate and "trick" fares.

Harold Crary, United's vice president in charge of traffic and sales, has explained his company's opposition to Capital Airlines' skycoach service between New York and Chicago and TWA's proposed 24-passenger DC-3 coach operation between Kansas City and Los Angeles. Inaugurated Nov. 4, Capital's "Nighthawk" coach flights had a 77 percent load factor in December. TWA's proposed low-cost Kansas City-Los Angeles operation is slated to start in February if CAB approves.

PROMOTION BOOST

American Airlines had these napkins printed and distributed to all food shops in Albany, N. Y., recently, promoting installation of Convair-Liners on Albany-Boston routes.

United is continuing its studies of the coach fare problem. But it wonders whether second-class operations would be profitable to anyone if, for instance, Capital's three competitors also instituted coach flights between New York and Chicago.

▶ **Split Ride Seen**—TWA's proposed Kansas City-Los Angeles coach fare is a device which can be used to break transcontinental air rates, Crary believes. Economy-minded passengers might fly first class from New York to Kansas City and then take TWA's DC-3 coach on to the West Coast.

Latest UAL protest is against Western Air Lines' plan to institute a system-wide 5 percent fare cut on Feb. 1—the reduction to be made possible by elimination of free meals on all flights (Aviation Week, Dec. 20). United has asked CAB to suspend the "no-meal" tariff pending an investigation.

▶ **Meal Cost Challenged**—Western's expenditures for meals have been considerably less than 5 percent of its total operating cost, according to UAL's complaint. During the second quarter of 1948, United listed its own cost of food and catering at only 1.9 percent of total operating expenses.

If Western's new tariff is approved by CAB, United believes it will have no alternative but to effect a similar 5 percent fare cut on its non-meal flights while maintaining present rates on flights where meals are served. UAL emphasizes that food service is necessary on many flights, "and the practice will be continued."

▶ **Airport Restaurants Inadequate**—United doubts whether airport restaurants on its routes or others are presently adequate to service a planeload of 44 to 50 passengers expeditiously. The saving proposed by WAL is small, UAL pointed out, and passengers might suffer enough discomfort from discontinuance of meals aloft to travel by surface means.

Western had stated that distances between cities on its routes are not such that anyone would require meal service aloft. Before proposing the new tariff, Western had, as an experiment, selected three points on its system where it fed passengers in airport restaurants while the plane was being loaded and serviced. This method met with favorable public response, according to WAL officials.

▶ **Sky-Pilot Tariff**—While protesting other new tariffs, United last week planned to file for CAB approval a spe-

cial fare of its own. It plans to offer clergymen a 25 percent discount on basic fares starting Mar. 1.

And WAL, paradoxically, has its difficulties with cut rates. An uncertificated carrier, California Central Airlines, slashed fares 50 percent recently in offering 28-passenger DC-3 intrastate service between San Francisco and Los Angeles. Western has protested.

▶ **NAL Fare Suspended**—Meanwhile, CAB has suspended, pending an investigation, National Airlines' proposed low-rate "Night Bird" tariff which was to go in effect Jan. 21 between New York and Miami. Using DC-6s northbound and DC-4s southbound, NAL planned to sell tickets on the late evening Night Bird trips for $55–$20.70 below the normal one-way fare of $75.70.

Eastern Air Lines protested that National's contemplated 27 percent fare slash—coming as it did during the peak traffic season on the New York-Miami run—was "insensible and incomprehensible." The Night Bird service would be equal if not superior to other flights provided by NAL, Eastern declared.

CAB's suspension of the Night Bird tariff is in line with the Board's belief that lower fares for legitimate coach-type services are justifiable, whereas cut rates on regular flights may be detrimental to the industry. The flights NAL had picked for its Night Bird run are now operating as part of the carrier's regular schedules, according to Eastern.

Tudors IVs Grounded Again By British

British South American Airways' Tudor IV aircraft have been grounded for the second time in less than a year following the disappearance of another BSAA plane during an over-water flight.

Latest loss involves a Tudor IV bound from Bermuda to Jamaica with 20 persons aboard. In January, 1948, one of the four-engine aircraft carrying 31 persons vanished en route from the Azores to Bermuda. A court of investigation appointed by the British Ministry of Civil Aviation declared last fall that the first mishap "must remain an unsolved mystery (AVIATION WEEK, Oct. 25).

▶ **Thorough Probe Planned**—Government-owned BSAA had five Tudor IVs at the time of the recent accident and expected delivery on another fourteen. As a result of the Caribbean mishap, all BSAA Tudor IVs now in service will be given a thorough examination.

The Tudor crash was seized upon by some Britons to criticize their government's aviation policies. Executives of England's nationalized airlines had complained frequently that they had little voice in selecting the type of planes tney were to use.

Finally, less than a month ago, BOAC, BSAA and British European Airways were given the right to order their own aircraft. In the future, the British Ministry of Supply, which has been the purchasing agency for the carriers, will be resposible only for encouraging development work on civil aircraft.

Emergency Plans Set By Air Forwarders

The Air Freight Forwarder Assn., holding its third annual meeting in Washington recently, set up a committee to develop plans for utilization of forwarder facilities and "know-how" in case of national emergency.

Questionnaires which will provide a complete and continuing picture of the air freight forwarders' resources will be prepared by the emergency mobilization group. The committee hopes to be able to make an immediate contribution to air transport planning and logistics upon call by the National Military Establishment.

John H. Stewart, president of Air Dispatch, Inc., Cincinnati, has been re-elected president of the Air Freight Forwarder Assn. for 1949. Other new AFFA officers are Arthur Cofod, Air Express International, New York, executive vice president; J. D. McPherson, Airborne Flower Traffic, San Francisco, secretary; George Haney, Skyways Forwarding, New York, assistant secretary; Peter A. Bernacki, Philadelphia, treasurer; Richard Spada, Personal Air Freight, East Boston, Mass., vice president-international affairs; and John Emery, Emery Air Freight, New York, vice president-domestic affairs.

AFFA last week was slated to argue its petition asking the U. S. Circuit Court of Appeals in Chicago to vacate its order of last fall which delayed execution of CAB's decision granting operating privileges to air freight forwarders. Pending further court action, CAB stopped issuing letters of registration to forwarders (AVIATION WEEK, Nov. 29).

ANALYZER INSTALLED

First Sperry engine analyzer for scheduled flight use has been installed in a Pan American Airways trans-Atlantic Constellation. All Connies on PAA's Atlantic Division and 20 new Boeing Stratocruisers will be equipped with the devices. The carrier says tests have proved the analyzers can cut expenses by $500,000 annually in reducing engine repair time and flight delays. Picture shows the analyzer installed in the Constellation engine control console. A flight engineer points out the scope built into the left side of his desk and the two switches overhead which select and identify the cylinders being examined.

Agreements Allow More Bargain Travel

Airlines are producing a flurry of new domestic and international fare bargains. They vary from a free ride from Montreal to New York, to a 25 percent fare reduction for clergymen.

Many of the new rate arrangements have been made possible by agreements between international and domestic carriers and represent some of the broadest pro-rated fare plans offered in airline history.

Most important pro-rated fares are being offered by Pan American Airways, British Overseas Airways and Colonial Airlines, to passengers traveling to Bermuda.

BOAC has a flat fare which permits air travelers to fly from 15 eastern cities to Bermuda by way of New York for the same cost as the basic New York-Bermuda fare—$126 round trip.

Passengers are carried from departure points to connect with BOAC in New York by three domestic airlines—American, Eastern and Northeast. Flights leave for Bermuda four days per week.

▶ **Free Ride to POE**—Air travelers get a free ride to the port of embarkation and are permitted to stay over in New York for several days enroute in either direction. BOAC and the domestic line share the cost.

Colonial Airlines, which has daily Skycruiser flights from New York to Bermuda and twice weekly flights from Washington, also has adopted a plan similar to BOAC's. It offers the same rate ($126) to all cities in the arc between Boston and Washington and permits stopovers in both Washington and New York.

▶ **PAA Plan**—Pan American has what it calls a triangle trip for the same price ($126). This permits travelers to start

at either of PAA's gateway cities, New York or Boston, or any airline point between, make the trip to Bermuda through one gateway and return to the departure point through the other.

Washington and Baltimore are also included in Pan Ams flat fare plan with trips originating from these points going through New York only.

Another Pan Am arrangement permits Canadians to travel to Bermuda via New York at rates equal to those for Dominion flights direct to the island. Travel between Canadian points and Pan Am's gateways will be via domestic or Canadian carriers.

PAA has also recently announced that the fare for the New York-San Juan flight has been cut from $133 to $100.

▶ **Longest Free Ride**—While it has not setup pro-rated fares on as broad a basis as the Bermuda arrangements, Air France undoubtedly came out in November with the longest free ride ever offered by an airline.

Canadians flying to Paris via Air France are flown all the way from Montreal to New York to make the Air France connection yet pay only the New York-Paris fare of $370.

This arrangement was made possible by an agreement between Air France and Colonial. The French line will absorb approximately 98 percent of the cost for the trip from Montreal. Usual fare is $21.30.

LAA Records

Los Angeles Airways, pioneer in scheduled helicopter airmail operations, is hanging up impressive records for similar carriers to shoot at in the future.

Between Oct. 1, 1947, when it started service, and Jan. 1, 1949, LAA handled 97,411,510 letters weighing 2,783,186 lb. During this period it made more than 65,000 landings on 40 small heliports in the Los Angeles area. Over 6000 of these landings were on the roof of the Los Angeles Post Office building.

First major mishap occurred as the helicopter service approached its sixteenth month of operation. On Jan. 21, a loaded Sikorsky S-51 taking off from the roof of the Los Angeles Post Office fell into an adjacent street, killing the pilot. An unequal distribution of weight was suspected as the cause of the crash.

In December, 1948 alone, LAA expedited over 15 million pieces of mail by as much as 24 hr. This volume represented a 400 percent increase over the same 1947 month, although plane miles flown were up only 100 percent.

To handle the heavier loads, LAA plans to modify its S-51s. An additional compartment several feet long may be added to the fuselage aft of the powerplant, boosting the craft's mail capacity from 750 lb. to well over 1000 lb.

LAA currently is the only active helicopter airmail carrier in the U. S. Helicopter Air Service, certificated by CAB for similar work in the Chicago area (AVIATION WEEK, Dec. 13), has not yet announced plans for starting operations.

Air Coach Contest

A New York travel agency which sells tickets for nonscheduled carriers is asking the public to join its efforts to save what it claims to be "an evidently bureaucratically pre-doomed industry."

It thinks the public can help determine the future of low-cost air transportation through a $100 essay contest.

Contestants have been asked to submit a letter of 50 words or less to Skycruises, Inc. Air Travel Agency, 319 West 48th Street, on the subject "Should Low-Fare Air Coach Service Be Permitted To Continue."

Hal Lee, Skycruises president, said: "The Civil Aeronautics Board, by its rulings, is trying to put us out of business . . . This contest will give the public an opportunity to express itself and help us present the facts to Congress."

Ten prizes will be awarded in U. S. Savings Bonds: First prize, $500; second, $200; third, $100; fourth, $50; and six $25 awards.

▶ **Training Program**—Skycruises also has started a national sales training program for its sales representatives throughout the country. It will include sessions on "how to sell" chartered air service to industrial firms and other groups.

Lee stressed the need for his program, "because of the many impractical regulations which the CAB is attempting to enforce regarding common carriage. The future of the non-scheduled airlines depends on the type of operation these men will be trained to perform."

Skycruises sold over 1000 tickets for nonsked and chartered flights to soldiers over the Christmas holidays.

Strike Averted

Strikes by ground personnel of American Airlines and Northwest Airlines have been averted for the time being.

American and the CIO Transport Workers Union agreed to place their dispute before the National Mediation Board. The union had reported that 4500 AA maintenance workers and stores personnel throughout the U. S. voted overwhelmingly to strike for a 16 cents an hour wage increase, severance pay, seniority provisions and other concessions. TWU originally demanded an additional 28 cents an hour, while the company's last offer was said to be 5 cents.

▶ **Emergency Board Named**—President Truman created an emergency board to investigate the dispute between Northwest Airlines and the International Assn. of Machinists. The board will report to the President by Feb. 18, and a strike cannot be called for 30 days thereafter.

At issue in the NWA-IAM dispute is the union's request for a 15¼ cents an hour pay increase for 2250 mechanics and workers in other ground service jobs from New York to Shanghai. Northwest reportedly offered a 5 to 8 cents an hour raise.

▶ **Communications Dispute** — Meanwhile, a demand by the Flight Radio Officers Air Safety Committee, representing both AFL and CIO groups, that code telegraph communications be installed and a communications officer added to crews on Pacific Northwest-Hawaii flights has been described as a "squeeze" by Northwest Airlines officials. The carrier said its voice radio communications have proved superior to the telegraph key method and that the former has been approved by CAA.

The union charged CAA with "great laxity" in permitting the 2700-mile over-water flights because the NWA planes could not communicate directly with surface vessels in an emergency. Northwest said that distress messages could be sent by voice to shore stations and relayed to ships about as fast as the key communications could work directly.

BOAC Selling Hythes

BOAC has now sold the greater part of its "Hythe" flying boat fleet. Aquila Airways of London and Southampton has bought 12 of the 30-ton planes for charter work. Three Hythes purchased from BOAC last year were used on the Berlin airlift between Hamburg and Havel Lake, Berlin, until ice stopped flying boat operations in December.

Some Hythes are still flying on BOAC's routes between England and Australia. They are to be replaced shortly by Constellations acquired from the Irish carrier Aer Lingus. As the double-decked Hythes come off the Australian run they will be handed over to Aquila Airways.

Convair-Liners

Domestic and foreign airlines took delivery on 106 Convair-Liners during 1948. As of Jan. 1, 1949, 52 of the twin-engine transports were still on order. Current rate of delivery is three a week.

Convair delivered 59 planes to American Airlines last year, and the carrier will receive 16 more, for a total of 75. Pan American Airways, Western Air Lines and Continental Air Lines received their full orders of 20, 10 and 5 Convairs, respectively, last year.

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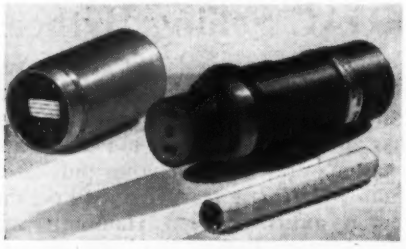

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SHORTLINES

▶ **Braniff**—Projected inauguration of nonstop service between Lima, Peru, and Rio de Janeiro has been delayed by CAB pending an investigation. Pan American Airways and Panagra protested against the new operation. . . . Braniff is considering use of JATO on planes operating into high-altitude South American fields and has been making tests with a DC-4 at La Paz, Bolivia.

▶ **British Caribbean Airways**—Has received a foreign air carrier permit from CAB authorizing service between Kingston, Jamaica, and Miami. Company plans to operate at least two roundtrips weekly with DC-3s.

▶ **British European Airways**—Although operating fewer planes, BEA flew about one-third more passengers and nearly twice as much mail and cargo in 1948 compared with 1947.

▶ **BOAC**—Sir Harold Hartley will resign as board chairman on June 30. He will be succeeded by Sir Miles Thomas, now deputy chairman. Whitney Straight will combine the deputy chairmanship with his present post of chief executive of BOAC.

▶ **Capital**—Has inaugurated weekend sightseeing flights over Washington, D. C.

▶ **Challenger**—Has received CAB authority to serve Casper, Wyo., and Vernal, Utah, on its Rocky Mountain feeder flights. Both cities are oil centers.

▶ **Chicago & Southern**—U. S.-Venezuela service is to be increased from four trips weekly to daily flights by Mar. 15.

▶ **Empire**—Has received temporary authority from CAB to serve Pasco-Kennewick-Richland, Wash. Atomic Energy Commission, which has offices at Pasco, backed the move.

▶ **Mid-Continent**—Is posting at all ticket counters weather reports covering conditions and forecasts for areas served by MCA. Passenger miles of traffic sold under the first-of-the-week family plan rose from 50,577 between Nov. 15 and Nov. 30 to 207,677 between Dec. 16 and Dec. 31.

▶ **Piedmont**—Has leased two DC-3s from United Air Lines.

▶ **Robinson**—Has completed installation of Very High Frequency radio and ILS equipment in all its planes.

▶ **Scandinavian Airlines System**—Carried 15,601 passengers between New York and Europe in 1948 against 12,555 in 1947. . . . Peter H. Redpath has become executive vice president.

▶ **Southern Airways**—Hopes to begin service on the Memphis-Atlanta and Atlanta-Jacksonville legs of its feeder system on May 1.

▶ **United**—W. E. (Dusty) Rhoades, who resigned recently as director of air navigation for the Air Transport Assn., has returned to UAL as chief of flight test engineering at San Francisco. He has also become a director of Transocean Air Lines, overseas contract carrier. . . . United plans to offer overnight DC-6 sleeper service between San Francisco and Honolulu starting Mar. 3. . . . The carrier has launched an intensive training program in preparation for Stratocruiser service on the California-Hawaii run.

▶ **Western**—Claims a new commercial airline speed record of one hr. 49 min. for the 575-mile trip between Portland, Ore., and San Francisco. Mark was set with a Convair-Liner, which averaged 316 mph.

Colonial Up In 1948

Better business during the last four months of the year enabled Colonial Airlines to carry a total of 142,563 passengers domestically during 1948—a gain of 7058 over 1947. Load factors for the first three weeks of 1949 were well ahead of the same period the year before. Advance bookings indicate Easter business on Colonial's Bermuda run may reach record levels.

CAB SCHEDULE

Jan. 31—Hearing in Milwaukee-Chicago-New York service case. Postponed from Jan. 24. (Docket 1789 et al.)

Jan. 31—Hearing on additional service to Puerto Rico. (Docket 2123 et al.)

Jan. 31—Hearing on TWA's complaint against Seaboard & Western Airlines. (Docket 3346.)

Feb. 1—Prehearing conference on Hughes Tool Co. control of TWA. (Docket 2796.)

Feb. 9—Hearing on Board's investigation of through service and interchange requirements at St. Louis and Memphis. (Docket 3426.)

Feb. 14—Hearing on Board's investigation of National Airlines route transfer. (Docket 3500.)

Feb. 14—Hearing on Board's enforcement proceeding against Nats Air Transportation Service. (Docket 3456.)

Feb. 15—Hearing on Florida trunkline service. (Docket 2215 et al.)

Feb. 15—Oral argument on Board's proposed revision of nonscheduled exemption.

Feb. 16—Hearing in reopened Mississippi Valley and Southeastern states cases. (Dockets 548 and 501 et al.)

Mar. 9—Hearing on Board's enforcement action against Transocean Air Lines. Postponed from Feb. 2. (Docket 3244.)

Apr. 11—Hearing in reopened Hawaiian case. (Docket 851 et al.)

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P. 7761 Aviation Week
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520 North Michigan Ave., Chicago 11, Ill.
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STRICTLY PERSONAL

RUBBING NOSES TO MAKE HEADLINES—You all know the old gag about rubbing two Boy Scouts together to start a fire. Pan American rubbed noses to grab the headlines. When PAA inaugurated its Seattle-Portland-Hawaii service recently, **Pascal Cowan**, resourceful publicity man on the west coast, thought up an angle that made all the papers, says **John Creedy** of PAA's news bureau.

"From Nome, Cowan brought a 21-year-old Eskimo girl named Mary Ann Amorak, flew her to Honolulu and had her photographed symbolically rubbing noses with a hula dancer. Miss Amorak went through with the silly business in good humor. When it was all over, and she was on her way back to Nome, she told Pascal:

" 'The trip was wonderful—but I felt awfully funny rubbing noses with that girl. What is it, an old South Seas custom?' "

* * *

VP UP A TREE—Secret agent **William Spencer**, publicity manager at Continental Air Lines, slips us a story about **Clarence West, Jr.**, CAL's senior vice president, who was literally up several trees during the Xmas season. The secret has been kept up to now.

"After Christmas, Clarence decided he could use several small, discarded trees to protect some of his valuable rose bushes. So he passed the word to a neighboring 7-year-old, promising a tidy two bits for each tree, provided they were only 'so high.'

"The word got around like a mosquito at a bathing beach. By New Year's Day —of all times—hordes of youngsters were besieging the West door, clutching all sizes and shapes of trees.

("He learned later that one ambitious mite had called someone down the next block and offered 10 cents for that Christmas tree 'if you throw it out right away so I can deliver it to Mr. West.' ")

* * *

TODAY'S NEW IDEA DEPARTMENT—We have a couple of "open letters" from **Gilbert Betancourt**, who is distinctly a man of ideas. Ordinarily, when an editor opens up something that starts out "OPEN LETTER TO . . ." he gets ready to duck. But this is different. Betancourt thinks a fiercely bitter editorial should be written about the old 6 cent air mail stamp that has been brought out of moth balls since the postage went up again. "The picture depicts a horrible cross between a DC-3 and the original DC-4 prototype of some 12 years ago," says he.

New idea No. 2 is a good, short name for the U. S. Air Force: The AIRMY.

New idea No. 3 is for a better streamlined, aerodynamic football which Mr. Betancourt is certain could be tested in NACA's best wind tunnels when there aren't any planes to test. Said new ball "would be easier to grasp, faster to pass and more interesting to play with," our correspondent advises.

(Read this column for variety)

* * *

NAVION EDITION OF THE U.N.—**Bill Wagner** of Ryan says **"Doc" Sloan**, assistant to Ryan VP **Earl Prudden**, is wondering if the up-to-date airplane salesman is going to have to be a linguist as well as pilot.

The other day while Sloan was demonstrating a Navion full of interested pilots, his guests were a Frenchman from Mexico City, an importer from Switzerland and a Mexican airline pilot. Each explanation required using three languages —English, French and Spanish—before everyone aboard was cut in on full verbal understanding. In a Tinker-to-Evers-to-Chanch arrangement it was **Sloan** to **Dardel** (English) to **Waltz** (French) to **Soto Reyes** (Spanish).

Sloan contends, however, that verbal understanding was not essential because "everyone was in obvious agreement about the delightful flying characteristics of the Ryan Navion."

* * *

SOUNDS LIKE AN ALIBI—This is true too, says **Ted Gilmore**, Mid-Continent's superintendent of air mail and air cargo. A shipment of chicks sent by TWA and MCA to Texas arrived damaged at destination. Shipper filed a claim with TWA. Finally, TWA's smart adjuster disclaimed their responsibility. He saw scribbled on a transfer manifest made out at K. C. the inscription "Goodenough.' MCA investigated. They asserted with some glee that it was only the signature of MCA Agent **Gerald Goodenough.**

R. H. W.

WHAT'S NEW

New Books

"Rocket Propulsion Elements," by George P. Sutton, supervisor of propulsion department, North American Aviation, Inc., and instructor in the University Extension division of the University of Calif. Volume is designed as introduction to the engineering of rockets. Available from John Wiley & Sons, Inc., 440 4th Ave., New York 16, N. Y. Hard cover, 294 pages, price $4.50.

"Principles of Jet Propulsion and Gas Turbines," by M. J. Zucrow, professor of gas turbines and jet propulsion, School of Mechanical Engineering and School of Aeronautics, Purdue University. Volume is designed to provide a basis for a working familiarity with the principles and analytical methods governing this area of modern engineering. 563 pages, available from John Wiley & Sons, Inc., price $7.50.

"Introduction to Aerodynamics of a Compressible Fluid," by Hans Wolfgang Liepmann, associate professor of aeronautics, California Institute of Technology, and Allen E. Puckett, chief, wind tunnel section, Jet Propulsion Laboratory, California Institute of Technology. Available from John Wiley & Sons, Inc., 262 pages, illustrated, $4.

Trade Literature

"Silicone Rubber," a 24-page bulletin describing G-E silicone rubber is available from the General Electric Co., chemical dept., Pittsfield, Mass.

"A Safety Device That Increases Production," a folder describing Microtrip, a new electrical device for two hand operation, available from Micro-Switch, Freeport, Ill.

"Catalog BL," a publication that features the new Wales punch retainer and other units, available from Wales-Strippit Corp., 346 Payne Ave., North Tonawanda, N. Y.

"Telegraph Systems Type 22," a folder describing the features of the Type 22 system, available from Lenkurt Electric Co., 1156 Country Road, San Carlos, Calif.

"ABC of Airports and Airliners," by Owen G. Thetford, a 92-page booklet on British craft and facilities. Available from Ian Allan, Ltd., 282 Vauxhall Bridge Road, Westminster, London, S.W. 1.

"Inco Magazine," winter edition, available from International Nickel Co., Inc., 67 Wall St., New York 5, N. Y.

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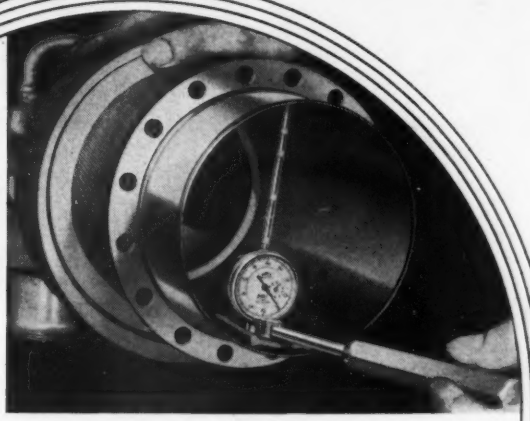

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EDITORIAL

Time for Caution

Few events recently have aroused as much interest in airline circles as Ralph Damon's unexpected resignation from the nation's largest domestic carrier to unite with a traditional rival and its picturesque, smart and always dramatic chief stockholder, Howard Hughes. Suddenly the bitter fight between Senator Brewster, the great Pan American Airways and Hughes flares anew.

Another reason for the keen industry interest is that there are few men in aviation who enjoy the confidence and respect that Ralph Damon commands. And such a man willing to fight for principles is usually a man who is worth watching.

It looks like another pitched battle in this very competitive and hard pressed industry. Pan American wants to buy American Overseas from American. American's chief executive is willing. So the aggressive PAA, which always knows what it wants, sees itself over one more hurdle toward its goal—to be the only U. S. flag international airline.

Editorially, AVIATION WEEK—as well as its predecessor, AVIATION NEWS—has always remained unequivocally opposed to monopoly by legislation. It still is. We oppose any Congressional attempts to set up one U. S. international air carrier.

Business dealings between our own airlines, however, are another matter. In the U. S. economy if one company consents to sell out to another, that is its own business. That, at least, is monopoly by choice, not by fiat. In the field of transportation, however, the appropriate government agency must first find no objection to such transactions on the basis of public interest.

It is difficult for us to see how the sale of American Overseas will insure better public service than AOA and PAA now offer separately. Certain economies would undoubtedly be possible. But the Civil Aeronautics Board must decide when economies start becoming liabilities to public service and national defense.

U. S. airlines are so far ahead of their foreign counterparts in all respects that the only kind of competition which now serves to advance the state of the art is the competition between the U. S. airlines themselves.

The proposed deal would cut out one of the three U. S. trans-Atlantic carriers, and we hope that does not happen. But if CAB should approve the deal, it would be difficult to accuse it of un-Americanism. We suggest that Mr. Hughes and Mr. Damon submit their own bid for American Overseas, and let CAB decide the next move.

At any rate, as we sit in the grandstands watching this "titanic spectacle", as the circus ads say, let us not forget the hidden potential danger to the industry.

This, like so many older problems, is another test of strength for five men on the Civil Aeronautics Board. Let us not provoke the same kind of thoughtless action in the White House that occurred in the Roosevelt era. The President finally became so embarrassed by the publicity involving the constant haggling among members of the Independent Air Safety Board that he abolished that very important body altogether. We have not yet recovered from that blow.

We must guard even more against thoughtless, precipitous action on Capitol Hill, which could set the industry back many years.

This impending struggle has dangerous possibilities.

The King Can Do No Wrong

You can sue the government of the United States of America under your constitutional rights. But the great Port of New York Authority remains legally sacrosanct.

This fact probably accounts for the high handed attitude of the Authority in its controversy with the airlines. Because the Authority recognizes no arguments but its own, no rights of others, no willingness to assume the slightest responsibility for the usual amentities of compromise that are necessary to start resolving a difficult fracas.

It has followed up its refusal to observe the airlines' Idlewild Airport leases, made with the city, by turning down the latest interim offer. This, despite the earnest request made from the bench by New York Supreme Court Justice Thomas J. Cuff. Three of the airlines had offered to deposit any difference in charges, to be determined later, for the use of the new Boeing Stratocruisers being delivered soon. Eight airlines have gone to court to compel observance of the leases.

George W. Whiteside, attorney representing the airlines, has a powerful argument. Describing the Authority as "this omnipotent body," he pointed out that as a landlord at the three New York metropolitan airports it is acting as a proprietor and not as an agency of government. Nowhere, he said, in the statutes creating the Authority, is there any specific grant of immunity.

"That stems from the old doctrine of the divine right of kings—that the king can do no wrong. But sovereignty after sovereignty has abandoned such claims. The Federal government can be sued. So can the State of New York. If the sovereign can thus be sued it is fantastic to assume that the creature of the sovereign, the Port Authority, is immune to the processes of a tribunal of justice."

Regardless of the legal points on each side, or the validity of the Authority's claims that airlines must pay more for their use of the airports, there is no reason for the Authority's stubborn refusal to permit the beginning of Stratocruiser service while the basic differences are being settled.

Dictators have never had long reigns in this country because public opinion and common sense of the people has always been able to win out over fancy legal tactics. The Port Authority is in danger of outsmarting itself on this deal because if it really has the public interest at heart it will make sure full operations are continued at those three airports.

ROBERT H. WOOD

In new plane production

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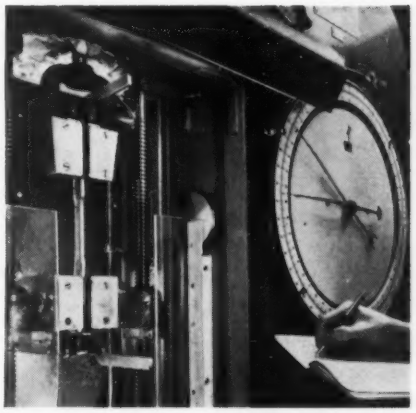

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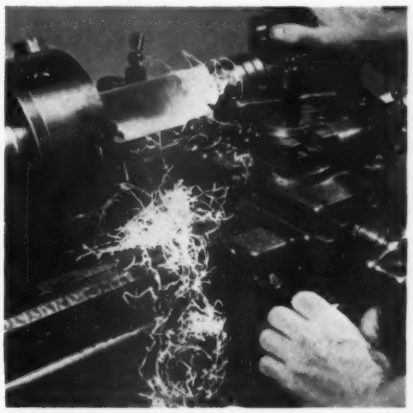

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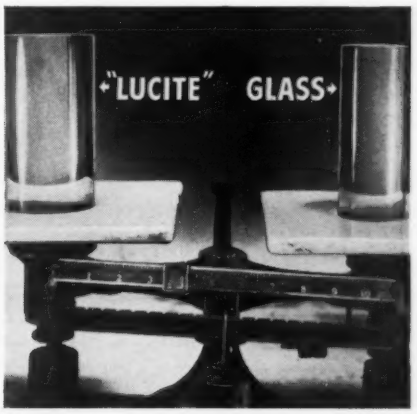

5. "Lucite" is light in weight. "Lucite" is only 50% as heavy as glass. Less than half as heavy as duraluminum, less than one-sixth the weight of steel . . . and less than one-seventh the weight of copper!

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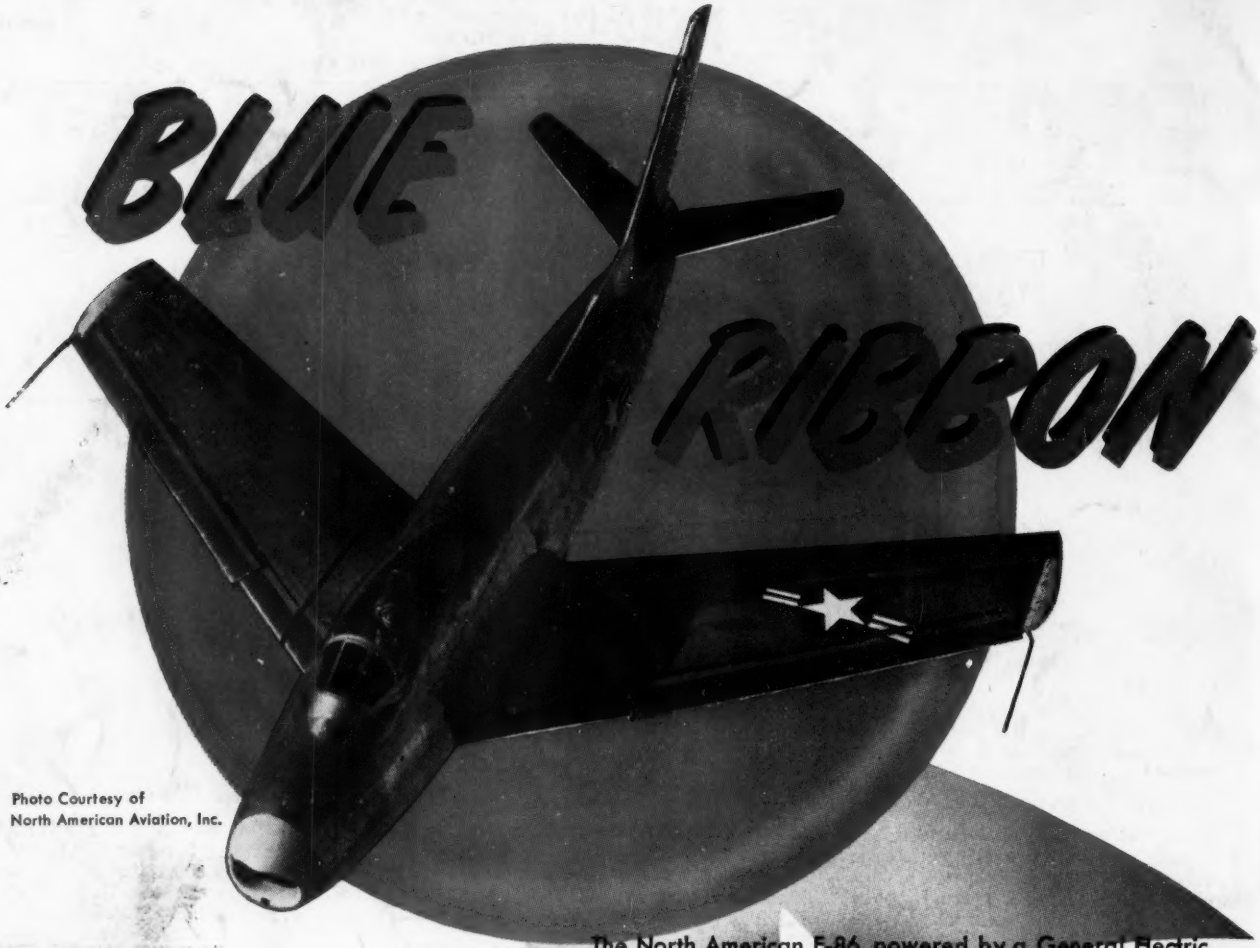

Photo Courtesy of
North American Aviation, Inc.

The North American F-86, powered by a General Electric TG-190 (USAF Type J47) turbo-jet engine, is the "blue ribbon" winner of the new official world speed record of 670.981 miles an hour.

Piloted by veteran ace Major Richard L. Johnson, the turbo-jet plane bettered its own unofficial record of 669.75 mph set at the National Air Races at Cleveland. The F-86 was completely armed and carried a full complement of ammunition. The new record was announced on Air Force Day by General Hoyt S. Vandenberg, Chief of Staff of the Air Force.

The TG-190 power plant of the super-streamlined F-86, was *developed* and *produced* by G-E's Aircraft Gas Turbine Divisions at Lynn, Mass. The former speed record of 650.796 miles per hour was set by a Navy Douglas D-558 "Skystreak" propelled by the General Electric designed TG-180.

General Electric research and engineering works continuously to improve existing products and to devise new means to assist its associates in the aviation industry. G-E leadership in the development and production of engineered systems and precision products for aircraft is available to you by contacting your nearest G-E office. *Apparatus Department, General Electric Company, Schenectady, New York.*

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